

# The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL XX. No. 519

JUNE 8, 1929

Prepaid Annual Subscription:  
United Kingdom, £1.10; Abroad, £1.20

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**NOTICES:**—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.

Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, have for some years past adopted the five-day week, and the editorial and general offices (Bouverie House, 154, Fleet Street, London, E.C.4) are closed on Saturdays.

Telegrams: "Allangas, Fleet, London."

Telephone: City 0244

## A Change of Government

THE one certain result of the General Election is the formation of a Labour Government. The uncertain factor is how long the Labour Party, now the largest single party in the House of Commons for the first time in its history, will govern the country. That will depend upon the nature of the measures which its members may introduce, for they are in a minority of the whole House and can be out-voted if any act of theirs outrages the feelings of the other two parties. For the present, however, the business world has to face a change of Government and to adapt itself to different conditions from those under which it has laboured for nearly five years.

There has been a very natural fear among business men that the absence of a clear majority for any one of the three parties may precipitate a second General Election within a few months. That would be a very disturbing factor to trade and industry, and there is a

certain reassurance in the efforts attributed to more than one of the party leaders to ensure that there shall not be another appeal to the country for at least two years. The average man of business takes the view that a very definite responsibility rests upon the politicians to make the Constitution work, notwithstanding the obstacles which the three-party system of their own invention have put in the way of its effective operation. If trade and industry are to have a fair opportunity to develop and expand, moderation in speech and action is demanded from the representatives of the nation sitting at Westminster, and more particularly from the new Government and their supporters. It would be idle to deny that there are elements of anxiety in the position. A change of Government, with the substitution of one set of principles for another, can have a very decided influence on the course of business in Great Britain. If the business man faces the future with fortitude, it is not on account of the success or failure of any political party, but because of his belief in himself and in the ability and courage of his associates.

Apart from ordinary political considerations, there is a desire to see in the House representatives who, in discussing scientific and especially chemical problems, can offer sound advice. From this point of view the defeat of Dr. G. C. Clayton, a director of Imperial Chemical Industries, at Widnes, will be regretted. Another former member, who was qualified to speak especially on the dyestuffs industry, was Commander Astbury, who has lost his seat in Salford. Sir William Alexander, we are glad to see, is again returned for Central Glasgow, and the Hon. Henry Mond repeated in East Toxteth his recent success in the by-election. Among other members associated more or less with chemical and allied industries are Colonel Sir F. Vaughan-Morgan (East Fulham), Colonel C. Ainsworth (Bury), Mr. F. A. Broad (Edmonton), Mr. G. le M. Mander (East Wolverhampton), Mr. Cyril Atkinson (Altrincham), well known as referee at safeguarding inquiries, Sir Basil Peto (Barnstaple), Sir W. Wayland (Canterbury) and Mr. F. G. C. Fison (Woodbridge). In the general list of re-elected members we notice with interest the name of Captain Wedgwood Benn (brother of Sir Ernest Benn, chairman of Benn Brothers) who has been mentioned as a likely member of the new Labour Government. Attention may also be drawn to the representatives of chemical industry and the profession of chemistry who figure in the Birthday Honours List. The list includes a peerage for Sir Edward Brotherton; knighthoods for Mr. H. Sutcliffe Smith, Alderman C. H. Bird, Professor H. C. H. Carpenter and Mr. R. T. Nugent; a G.B.E. for Sir Arthur Duckham; a G.C.M.G. for Sir John Cadman; and an M.V.O. for Professor E. C. Dodds.

### A Membership of 17,273

It is not surprising to read that "prolonged applause" greeted the announcement made by Dr. Parsons, the Secretary of the American Chemical Society, at the last meeting of the council, that there had been an increase in membership during the year of over 1,000 members, and that the total membership on April 1 was 17,273. The Society thus finds itself in the best position of its career in membership gains and totals, as well as in the variety and success of its activities. Numbers, it is true, are not everything, but they may be very important as symptoms of health or sickness. An advance of 1,000 members in one year is barometric evidence of abundant vitality and vigour. It suggests a future even more than a past. A stationary membership is always a little depressing, even where there is reason to think that the ground still held will not actually be lost. Where, however, over a period of years there is a steady though slight decline of numbers, the inference is irresistible that the patient needs attention, and it is folly to ignore such evidence of organic trouble.

Other interesting points in the work of the American Chemical Society include the proposal that a bust of Josiah Willard Gibbs be placed in the Hall of Fame of the University of New York, the decision to award the Priestley Medal of the Society to Mr. Francis P. Garvan at the meeting next September, and the approval of the transfer of the Society's journals and books now in the Chemists Club Library to the new corporation of the library, following an announcement that the Club intends to raise a library endowment fund of \$400,000.

### British Dyestuff Production

THE chief feature of the official statistics of British dyestuff production for 1928, published recently, is the substantial all-round increase in production that they reveal over 1927. The total output has advanced from 39,551,756 lbs. in 1927 to 50,907,080 lbs. in 1928. That represents an increase of close on 29 per cent. for the year, which must be regarded as a very satisfactory rate of progress. What is equally satisfactory is the fact that every class of dyestuffs except one represented in the return has contributed to the total increase. The solitary exception is sulphur colours, which show a decline of 536,871 lbs. (from 7,117,233 lbs. in 1927 to 6,580,362 lbs. in 1928). Against this there are increases in direct cotton colours of 1,321,555 lbs., in acid wool colours of 1,293,191 lbs., in chrome and mordant colours (including alizarine) of 2,092,508 lbs., in basic colours of 499,887 lbs., in vat colours (including indigo) of 2,468,419 lbs., in dyestuffs for lake-making of 353,136 lbs., and in oil, spirit, wax, and miscellaneous colours of 3,863,499 lbs. The large advance in the production of vat colours is especially notable and satisfactory, since it demonstrates the British manufacturers' mastery of this branch of the industry, and indicates the growing demand for colours with a high standard of fastness.

The companion table issued by the Board of Trade relating to applications and licences under the Dyestuffs (Import Regulations) Act is also interesting.

Here, again, the statistics relating to the importation of foreign colours show a steady increase over the years 1921-28. In that period the number of import licences granted has risen from 4,975 to 7,051, the quantities of dyestuffs licensed from 2,677,505 lbs. to 5,030,511 lbs. the value of dyestuffs licensed from £1,042,821 to £1,074,113, and the total amount of licence fees charged from £3,231 os. 7d. to £3,561 15s. As an example of the disparity between value and bulk, it may be noted that while the quantity of dyestuffs licensed has almost doubled the value remains nearly the same.

### For the East End Boy

LORD MELCHETT, who, in spite of his heavy business responsibilities, still finds time for a personal interest in good causes, has, we are interested to hear, consented to preside at a banquet on June 25 at the Savoy Hotel on behalf of the John Benn Hostel, and several well-known figures in the chemical industry will also be present, such as Dr. Levinstein (president-nominate of the Society of Chemical Industry), Mr. Davidson Pratt (general manager of the A.B.C.M.), Professor Hinchley (secretary of the Institution of Chemical Engineers), and Mr. F. W. Goodenough (Gas Light and Coke Co.). A brilliant toast list has been arranged, which includes the present Headmaster of Eton, the Dean of St. Paul's, Mr. A. P. Herbert, the Mayor of Stepney, Sir J. Tudor Walters, Sir Ernest Benn and Captain Wedgwood Benn, M.P. It will, incidentally, be the first public occasion since the general election when the two "Brothers Benn" will appear together. A distinguished company is expected to be present, and the honorary secretary of the Hostel (Bouverie House, Fleet Street) will be glad to hear from any who would care to have seats reserved for them.

The work of the Hostel, already so well known, has just received still another mark of Royal favour, this time from the Queen, who has sent a miniature edition of Shakespeare and one or two other special gifts to be sold by auction at an Old English Fair, to be held at Chislehurst on June 13, on behalf of the Hostel. Last month, it may be remembered, Princess Mary Viscountess Lascelles attended the *Mr. Cinders* matinée in the same cause. Those who support the banquet on June 25 may, therefore, count on an evening's entertainment of exceptional distinction and interest, and at the same time have the satisfaction of aiding a cause whose merits and needs are beyond doubt.

### S.C.I. Secretaryship

#### Resignation of Mr. H. T. F. Rhodes

##### Succeeded by Mr. H. J. Pooley

WE understand that Mr. H. T. F. Rhodes, who was recently appointed Secretary of the Society of Chemical Industry, in succession to Dr. Longstaff, the retiring secretary of the Society, has resigned the appointment and terminated his duties. Mr. H. J. Pooley, Honorary Secretary of the Chemical Engineering Group, has been appointed in his place. No official announcement as to Dr. Longstaff's retirement has yet been made, but at the annual meeting of the Society in Manchester in July a presentation is to be made to him.

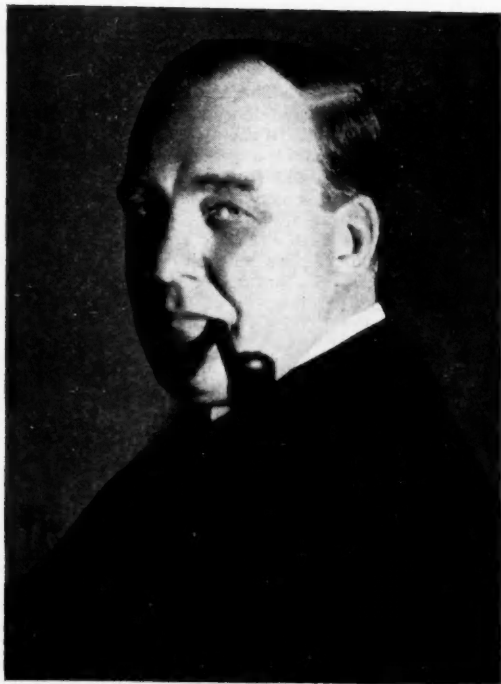
Chemical Leaders in the Honours List



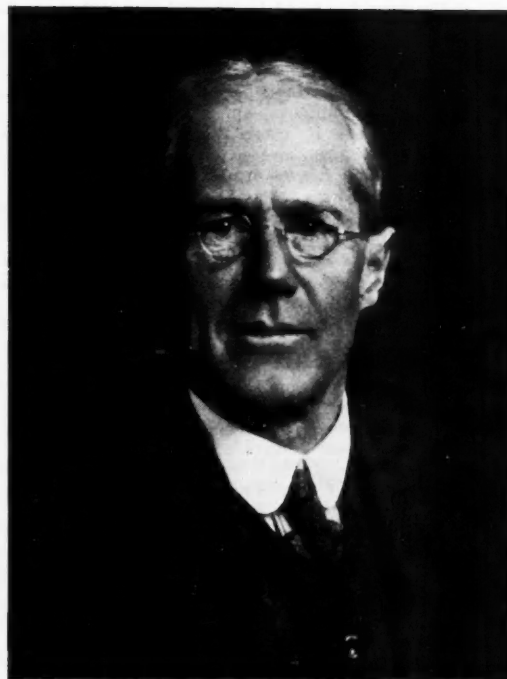
*Sir Edward Brotherton, who is raised to the peerage as a Baron.*



*Mr. H. Sutcliffe Smith, who receives a knighthood.*



*Sir Arthur Duckham, who becomes a G.B.E.*



*Professor H. C. H. Carpenter, F.R.S., who receives a knighthood.*



## Merchandise Marks for Scientific Glassware

### Board of Trade Inquiry Opened

THE inquiry into the application for a marking Order under Part II. of the Merchandise Marks Act, to provide for the marking of imported scientific glassware, including tubing and rod, was opened at the Board of Trade Offices, Westminster, London, on Monday, by the standing committee appointed by the Board of Trade under the Act, and presided over by Sir Hubert Llewellyn Smith. The application was made by the British Chemical Ware Manufacturers' Association and the British Lampblown Scientific Glassware Manufacturers' Association, who were represented by Mr. R. Moritz, K.C., and Mr. D. Baker. There were objections by the china and glassware section of the London Chamber of Commerce, the British Laboratory Ware Association and other groups of British manufacturers, all of whom were represented by Mr. N. L. Macaskie and Mr. Horace Samuel.

#### Grounds for the Application

Mr. MORITZ said that scientific glassware was already chargeable with duty under Part I. of the Safeguarding of Industries Act, 1921. The present application covered all articles in Lists C and C ii of the lists of articles chargeable with duty, these two lists comprising the scientific glassware chargeable with duty. The applicants asked that the marking Order for which application was made should cover silica ware also.

Before the war there was no British trade in scientific glassware, and the whole of the scientific glassware used in this country, with very few exceptions, was imported from Germany or Austria. At the outbreak of war a very serious situation had arisen; the country was involved in scientific researches which called for very much larger supplies of these materials than were needed formerly. The Ministry of Munitions acted with characteristic energy, and as a result the Institute of Chemistry and the Society of Chemical Industry took the matter up with a view to making up the deficiency.

#### A New Industry

At the end of the war an industry had been created in this country, though at very great expense, whereby we could beat the Germans and Austrians at their own game; we could make practically all the shapes of scientific glassware as well as, or better than, could Germany or Austria. At that time, however, the British firms which had been making this glassware were so crippled by the immense capital expenditure that had been necessary that the industry had to be safeguarded. There were now six large firms and several smaller ones engaged in the industry, the six larger firms being John Moncrieff, Ltd., of Perth; Wood Bros. Glass Co., Ltd., of Barnsley; Chance Bros. and Co., Ltd., of Birmingham; Hands and Sons, Ltd., of Birmingham; James A. Jobling and Co., Ltd., of Sunderland; and Plowden and Thompson, Ltd., of Stourbridge. He believed they were all members of the British Chemical Ware Manufacturers' Association. The industry was now able to make practically everything required, and in sufficient quantities to meet the demand.

Directly after the war, grave complaints had been made as to the quality of the glassware. The Institute of Chemistry set up a special committee to inquire into the matter, and it was found that the glassware of which complaints were made was either glass of a pre-war "vintage," or glassware imported from the Continent, and which had been thought to be British. The committee had found that the genuine post-war British glassware was good.

At present, nearly all the British manufacturers marked their goods, as did also the Continental manufacturers of high reputation. The marks could be applied quite simply by sand-blasting, engraving, acid etching or enamelling, and the cost of marking was absolutely negligible. The applicants asked that the glassware should bear the marks at the time of importation. There might be certain articles which it would be difficult to mark by the means referred to, and in such cases it might be preferred that the containers only should be marked. They did not include articles of which glass formed only a negligible part. Also, they did not wish to include glass prisms and lenses.

The application, added Mr. Moritz, was backed by the two main trade unions concerned—the National Flint Glass Makers' Society and the National Union of General Workers. The value of the scientific glassware imported in 1928 was about £70,000, including tubing and rod. Re-exports amounted to less than £7,000, but protection was afforded by the Act with regard to the re-exports.

Glass tubing and rod were to some extent the raw material of those engaged in making scientific glassware, and they were also imported on a very large scale for sale to laboratory chemists. It might be suggested that the marking of tubing and rod was impracticable. It was perfectly possible to mark the ordinary half-inch external diameter tubing, for instance (which was generally sold in 5-ft. lengths bound together in bundles), by an etching at each end of each length.

Mr. Moritz said he would submit at a later stage a list of the articles the origin of which could best be indicated on the containers.

#### Evidence in Support

Mr. DOUGLAS BAIRD (of Baird and Tatlock (London), Ltd., scientific instrument makers), chairman of the British Chemical Ware Manufacturers' Association, and a member of the British Lampblown Scientific Glassware Manufacturers' Association, gave evidence in support of the application. All the graduated ware sold by his firm, he said, was made by them from British glass, but they imported from abroad certain articles which so far they had been unable to obtain in this country. Inquiries of members of the applicant Associations had shown that approximately 3,000 workers were engaged in the industry in this country, and the gross turnover of the manufacturers was about four times the value of the annual imports—i.e., about £300,000. Practically all the articles made by members of the Associations were marked with the names of the makers, and he believed some of them bore an indication of British origin. The cost of indicating origin by means of acid-etching did not exceed sixpence per gross of articles.

Dr. M. W. TRAVERS, F.R.S. (a Fellow in Applied Chemistry and Honorary Professor in the University of Bristol), who gave evidence in support of the application, said he had been a user and purchaser of scientific glassware in large quantities both in England and India. There was a genuine desire to buy British glassware, and confidence in the ability of British manufacturers to produce it. In the absence of marking, it was impossible for the ordinary purchaser, and very difficult for the expert, to distinguish British from foreign glass. British glass tubing had acquired a very high reputation. In reply to the chairman, he said it would not be possible to distinguish the origin of glassware even by chemical analysis, because makers might at any time alter their compositions.

Professor W. E. S. TURNER, head of the Department of Glass Technology, University of Sheffield, corroborated Dr. Travers's evidence. With regard to the possibility of distinguishing between British and foreign glassware by means of chemical analysis, he said it might be possible for him, because he was in very close touch with British manufacturers and could get information as to the compositions they used; but the ordinary worker in chemistry or physics could not.

#### Dr. Freeth's Evidence

Dr. F. A. FREETH (chief research chemist, Imperial Chemical Industries, Ltd.) also gave evidence, and said there was a very strong desire among research chemists with whom he was associated, and in the Universities, to use British glass wherever possible. He could not distinguish between British and foreign glassware in the absence of marking. It was the settled policy of Imperial Chemical Industries, Ltd., to buy British goods wherever possible. He agreed with previous evidence that etching at both ends of each length of glass tubing would not materially increase the price.

Replying to Mr. G. N. Barnes (a member of the committee), witness said that the work of making the glass articles was highly skilled. Some time ago, being unable to find the glass-blowers he required in this country, he had imported two



Dutchmen, and these men were now engaged on the training of boys. The training of a glassblower occupied five years.

Mr. BAIRD, who had given evidence previously, was then cross-examined by Mr. Macaskie (counsel for the opponents), who pointed out that the 3,000 workers who were said to be employed in the British industry produced only £300,000 worth of goods, so that apparently the average annual production per worker was £100 worth. Mr. Baird replied that the workers referred to were not all engaged in the manufacture of scientific glassware for the whole of their time, but were engaged sometimes on other classes of work. Nevertheless, their services were essential to the production of scientific glassware.

At the opening of the hearing on Tuesday, Mr. Moritz put in a list of articles which the applicants said were too small to mark individually and which they suggested should be marked on the container. The articles were blowpipe jets, glass eyes, tubing under 5 mm., arsenic tubes, ampoules, glass cells, vaccine tubes, hollow prisms, microscope cover glasses, burette jets, glass valve flanges and test tubes up to 6 inches in length and up to five-eighths of an inch in external diameter.

#### Cross-Examination

Mr. Macaskie, continuing his cross-examination of Mr. Douglas Baird, pointed out that according to Mr. Baird's own figures there were 3,000 employees in the scientific glassware industry producing a total output of £300,000 per annum, and he said that the industry could not carry on on the basis of those figures. Mr. Baird agreed that the figures stated in that way did not seem justified, but he explained that they were very difficult to get out because some men were employed on the manufacture of scientific glassware only part of their time. Mr. Baird put in figures which showed that the cost of tubing to make a dozen articles was 1s., whereas the cost of the finished articles was 10d. to 1s. each, and therefore in that case the finished article was worth ten times the original tubing.

Witness stated that the National Physical Laboratory issued certificates certifying the accuracy of graduated glassware submitted to them. There was a class A for the highest grade, and a class B, while there were other ordinary commercial graduations.

Mr. Macaskie said that the cost of graduating and figuring in the best apparatus was further increased by the fact that a fee had to be paid to the National Physical Laboratory, whether the glass submitted to it qualified for class A or whether it was rejected.

Dr. L. H. Lampitt, chief chemist to J. Lyons and Co., Ltd., was then called. His firm employed 97 chemists and were large buyers of scientific glassware. He had found a desire among such people to use British scientific glassware.

#### N.P.L. Charges

Mr. H. J. Elliott, of Hatton Garden, London, a graduator of chemical apparatus, said that he graduated both British and foreign blanks, and that it was very difficult for him to tell British blanks from foreign ones. He could tell in some cases, but not in all. Sometimes he had to grade foreign blanks with English wording. He submitted fees that were charged by the National Physical Laboratory for the testing of graduated glassware, and in one case the charge was 4s. 6d. for a graduated flask, and in another 8s. for a graduated cylinder.

Mr. Macaskie: If you paid those prices, then the total cost of those articles is out of all proportion to the cost of the original blanks? Yes, because we have to take into account the fees for rejection as well as those passed for accuracy. Contrasted with those charges, witness said that the cost of marking a lamp-blown flask would be at the rate of 2s. a hundred after manufacture, and it would be considerably less if the marking were done during the process of manufacture.

Mr. Macaskie: Then we must not take your evidence to bear on the cost of cheaper articles, such as test tubes?—The approximate cost of marking test tubes would be 2s. a hundred.

Mr. Barnes asked what was the proportion of scientific workers who used class A? Witness replied that very little was used in the laboratory. When there were twenty or thirty chemists, perhaps only the head chemist had National Physical Laboratory apparatus.

#### The Trade Union View

Alderman W. Bradford, J.P., the general and financial secretary of the National Flint Glassworkers' Society of Great Britain and Ireland, was then called. Many of the members of his union, he said, were engaged in making scientific glassware. Wood Bros., some four or five years ago, had 150 men who at that time worked in the scientific section of the glass industry. Unfortunately, at the present moment, the majority of those men were out of work, and having run through their scale of unemployment benefit they were now scattered and he could not say what would become of them. After the war, the Government appointed three members of his Association, including himself, to train men in the scientific section of the trade, and upwards of 200 men were so trained at training quarters at Tottenham and Bermondsey. The foundation had been laid whereby those men would have been able to get a respectable living, but unfortunately through foreign importation being again allowed, the whole of those 200 men were thrown on the streets. They represented a section of his organisation, and that was why they had requested him to come to the inquiry to press home, as far as possible, that they as British glassworkers should have a fair and legitimate opportunity of getting a living in the industry in which they had spent the best part of their lives. His own organisation had to-day over 70 per cent. of its members unemployed because of foreign importation and because of the lower wages and longer hours on the Continent.

Mr. A. F. Miller (of the Thermal Syndicate, Wallsend-on-Tyne) said that his firm were big manufacturers of silica ware for scientific purposes, and they were faced with considerable foreign competition. In 95 per cent. of the cases it was impossible to differentiate between silica products coming into this country unmarked and British products. Marking could easily be done at a small cost, and his experience was that people wanted British glassware.

#### Thermometers

Mr. H. H. Zeal (of G. H. Zeal, thermometer manufacturers of St. John Street, London) said that they sold their thermometers with their own trade mark, while at the same time a considerable number of foreign thermometers came into the country without a trade mark. It was difficult to tell the difference between foreign and British ones.

Mr. M. Ryle (commercial manager of the Osram, G.E.C. glass works, which also manufacture tubing and rod) then gave figures of the output of his firm, which, he said, was capable of considerable expansion. In the last calendar year there were about 390 tons of tubing and rod imported into this country.

Mr. Moritz: Could you have supplied it? We could have supplied that quantity, but I do not know about the quality, because I do not know what the quality was.

Mr. M. Zambra (of Negretti and Zambra, manufacturers of thermometers and barometers, and chairman of the Lamp Blown Scientific Glassware Manufacturers' Association) said there were considerable imports of thermometers and barometers, mostly from Germany, and he said it was impossible for anyone outside the trade to distinguish imported from British ones.

#### Evidence for the Opponents

Mr. J. Davies (managing director of A. Gallenkamp and Co., Ltd., Sun Street, Finsbury Square) was then called as the first witness for the opponents. He said that his company were manufacturers of scientific apparatus, and were dealers in and manufacturers of laboratory fittings. They were members of the British Laboratory Ware Association, Ltd., and were contractors to the War Office, the Admiralty and the Colonial and Indian Governments as well as several foreign governments and many public bodies. The metal used for parts of certain articles was often very expensive, and the cost of the foreign glass varied from only 10 per cent. to 50 per cent. of the cost of the finished article; and if the glass parts of such articles were marked foreign, such a mark would brand the finished article as foreign and would inflict considerable injury on their trade as British manufacturers. They anticipated considerable damage to their re-export trade if a marking order were made.

The inquiry was then adjourned until 10.45 on Monday, June 10.

## The Proposed Changes in the American Chemical Tariffs

By Dr. Alfred Marcus (Berlin)

*A good deal has been heard recently of the agitation in the United States for higher duties on chemical substances. Below appears an interesting article on the subject from the pen of a Continental correspondent.*

THE sub-committee of the U.S. House Ways and Means Committee, on Schedule No. 1, chemicals, oils and paints, made public in connection with the introduction of a Bill, on May 7, a report containing the arguments on which the changes in the chemical schedule of the flexible tariff provided in the Fordney-McCumber Bill of 1922 are founded. This report shows distinctly the intentions of the American chemical industry, which desires to enforce the independence of the American chemical market from imported goods. In this way, increased duties preponderate in the proposed new schedule, and the number of decreases is small. Acceptance of the Bill by Congress will render American trade extremely difficult for European chemical industry.

In the preface to the report it is stated that the equivalent *ad valorem* rate for the dutiable items of the chemical schedule imported under the Act of 1922 up to 1928 is 33.78 per cent., compared with an average of 37.67 per cent. for all dutiable items imported during the same period. Furthermore, the percentage of imports (by value) of duty-free chemicals to that of all dutiable chemical imports under the Act of 1922 is 71.83 per cent., as compared with 62.73 per cent., the ratio for all duty-free imports to all dutiable imports. The equivalent *ad valorem* rate on all chemicals dutiable and free, imported under the act of 1922, is 9.39 per cent. as compared with an equivalent *ad valorem* rate of 14.04 per cent. on total imports of all kinds during the same period. It is therefore pointed out that it cannot be successfully contended that the rates of duty in Schedule 1 of the act of 1922 are above the levels of other schedules.

### Not a Revision, but a Readjustment

Furthermore, it is stated that the general treatment of the schedule by the committee is in no sense a revision, but rather a readjustment in certain items in order to meet the changed conditions in certain industries since 1922. This schedule contains many hundreds of items. The committee received requests for changes in 70 of the 93 paragraphs of the chemical schedule. Changes in rates have been made in only 29 of these paragraphs. In addition, about 32 commodities have been specifically mentioned, and there have been changes in phraseology in certain paragraphs in order to avoid litigation and ambiguity. Rates have been changed on 39 commodities, of which 33 were increases and 6 were decreases. Some of the increases represent adjustments of compensatory duties which were out of line with the base rates, and these have been properly adjusted.

Thirteen items have been transferred from the dutiable list to the free list, of which seven are of particular interest to agriculture: The fertiliser materials urea, fish scrap, fish meal, and tankage; the insecticides calcium arsenate and Paris green; and santonin and its salts. Other items transferred include materials not produced in U.S.A.—buchu leaves, a crude botanical drug; liquorice root, the raw material for liquorice extract; and argols, tartars, and wine lees, the raw materials for tartaric acid and cream of tartar. Of the seven transfers from the free list to the chemical schedule, three items—citrus juice, palm-kernel oil, and sesame oil—pertain to agricultural products; the other items include chromic and nitric acids, kieserite, and spermaceti wax.

### Development of U.S. Chemical Industry

The chemical industry in the United States has undergone striking developments during the seven years in which the present tariff act has been in operation. New processes have reduced costs and rendered old methods obsolete. Many new products have been developed. The ability of America to apply research to the solution of manufacturing problems and the development of new products has been remarkable.

The coal-tar chemical industry became firmly established in the United States as a result of the war. Since then, under the protection afforded by the act of 1922, it is claimed that the industry has continued to develop so that to-day it represents an investment of about 100,000,000 dollars and employs 10,000 men. The years since 1922 have been charac-

terised by sharp competition between domestic manufacturers, a decreasing number of manufacturers, lower prices for dyes and other products, and an increased demand for fast colours.

Other important developments in the American coal-tar industry include the production of phthalic anhydride by cheaper methods, the production of synthetic phenol from benzene, and the development of insecticides and fungicides. The production of new chemicals for the rubber industry is of more than usual significance, in that by the development of anti-oxidants, of accelerators for vulcanisation, and compounds for improving the ageing of rubber, the life of many rubber articles has been extended, in some cases from 100 to 500 per cent.

### Recommendations

Requests were made for the restoration of the original rates which obtained in § 27 and 28 for two years after the date of the passage of the act of 1922. These rates were automatically reduced under the provisions of the act from 60 to 45 per cent. *ad valorem* in § 28 and from 55 to 40 per cent. *ad valorem* in § 27. In view of the creditable progress of the industry, and the further facts as to its status and condition disclosed upon the hearings, the committee recommends the continuance of the present rates based upon the American selling price as provided in the present law.

In this connection attention is called to a further important recommendation, viz., that the provision of the existing law prohibiting any increase of the rates in § 27 and 28 under section 315 be struck out. In view of the automatic reduction from the temporary to the permanent rate, there does not appear to be any sound reason for longer retaining this distinction in the application of the flexible provision. The adoption of this recommendation will afford thereafter the benefit of this remedy to all items in the schedule.

### Synthetic Resins

The United States synthetic resin industry has shown a phenomenal growth in the last seven years. The total production of resins from coal tar products has increased from between four and six million pounds in 1921 to 20,800,000 pounds in 1928.

The production of citric acid from cane sugar is an outstanding example of successful American research, which followed the substantial increases in the duties imposed by the act of 1922 on citrate of lime and citric acid. Certain moulds were developed which fermented the sugar so as to yield citric acid. This achievement, together with the output of the California citrus by-product industry, rendered the United States independent of raw materials imported from Italy. It also enables them to buy citric acid at a price lower than is obtained in England, France or Germany. These countries continue to be dominated by the Italian monopoly control of both the raw materials and the finished product. Under the act of 1922, lemon juice, a raw material for citric acid, enters duty free, whereas citrate of lime, also a raw material, carries a duty of 7 cents per pound. Imports of lemon juice increased tremendously under these conditions. Lemon, lime and orange juices unsuitable for beverage purposes have therefore been transferred from the free to the dutiable list.

### Chromium and Vanadium Compounds

Chromic acid has only recently risen from a position of minor importance to one of prominence as an industrial chemical. This change is due to the development of chromium plating for the fittings of automobiles and for plumbing fixtures. Nine or more firms are now manufacturing chromic acid in the United States. Competition is severe, and prices have decreased. It has been on the free list of previous tariff acts. Because of increased competition from imported material it has been removed from the free list.

Vanadic acid, its anhydride, and its salts, are chemicals which have become of high importance as catalysts within the past few years. Vanadium compounds are already used in large quantities in the United States for the production of sulphuric acid. Nearly every sulphuric acid plant recently

erected or in the course of construction is designed for the use of this material as to the contact catalyst in place of platinum. Thus, not only is a cheaper material substituted for the expensive platinum, but high yields of sulphuric acid are obtained, thereby effecting substantial savings in costs of sulphuric acid. Furthermore, vanadium catalysts make possible the use of United States raw materials not formerly employed because they contaminated the platinum. The importance of vanadium chemicals to the national welfare led the committee to insert a separate paragraph providing for these materials, formerly in the general paragraph.

Formic acid, an important chemical in the dyeing and tanning industries, was made in the United States during the war, but this production ceased from 1923 to 1928, when two firms began its manufacture. With the increased demand and price of acetic acid, formic acid is assuming greater importance as a substitute than formerly. The act of 1922 made no mention of formic acid; consequently it was dutiable under a general clause at 25 per cent., which is a lower duty than that on oxalic acid made from the same raw materials, and costing only slightly more to produce.

#### Fixation of Nitrogen

One of the outstanding accomplishments of the period covered by the present tariff act, it is claimed, is the rapid development in the United States during the last two or three years of the fixation of atmospheric nitrogen in the form of synthetic ammonia. Plants for the production of nitric acid by the oxidation of anhydrous ammonia are displacing the old process of manufacture from Chile saltpetre. The ultimate capacity of the plants now in operation and under construction will render the United States entirely independent of foreign raw material—that is, Chile saltpetre—for the manufacture of nitric acid. In addition, one large plant is producing synthetic nitrate of soda for fertiliser purposes.

In recommending no change in the present duty of 2½ cents per pound on casein, the committee was guided by several factors of vital importance. Casein is among the leading imports of chemical raw materials. Over 75 per cent. of the consumption is used in the manufacture of coated paper. Less important uses are in casein glue for plywood manufacture, in cold water paints, and in spray insecticides. For several years, imports, chiefly from Argentina, have been supplying from 50 to 60 per cent. of the total domestic consumption. Strong representations have been made by dairy interests for an increase in duty from 2½ to 8 cents in order that the entire consumption may be supplied by domestic production, thereby affording a market for the surplus of skimmed milk which now largely goes to waste. Equally strong representations have been made by representatives of the coated paper manufacturers, supplemented by briefs from casein glue manufacturers and consumers, for restoring casein to the free list, as it was under the act of 1913.

#### Standard Specifications for Paints and Paint Ingredients

THE British Engineering Standards Association has just issued a further five specifications, these forming part of the series of sixty-one paint and varnish specifications which have been in course of preparation during the last two years. These are:—No. 389-1929, Zinc Chromes for Paints; 390-1929, Oil Pastes (Coloured) for Paints; 391-1929, Tung Oil; 392-1929, White Titanium Dioxide Pigment for Paints; and 393-1929, Tinted Oil Pastes for Paints. As in previous specifications in this series, they contain clauses regulating the composition, together with standard reception tests for the purchaser of these materials; appendices being also incorporated outlining standard methods for carrying out the tests. Copies may be obtained from Publications Dept., British Engineering Standards Association, 28, Victoria Street, London, S.W.1, price 2s. 2d. each, post free. There now only remain four specifications to complete the series, namely:—Turpentine, Type 2; Aluminium Powder for Paints; Purple Oxide of Iron, Ready Mixed Paints; and Venetian Reds for Paints, which are being prepared, and will be issued shortly. In addition, a British Standard Schedule of colours for ready mixed paints is being prepared, which should form a very useful guide not only to technical men but to every householder.

### A Bookman's Column

UNDER the superintendence of a strong committee, the McGraw-Hill Publishing Co. is issuing a series of text-books and works of reference known as the Chemical Engineering Series, of which the latest publication is *Inorganic Chemical Technology*, by W. L. Badger and E. M. Baker (pp. 228, 12s. 6d.). The production of the following substances is discussed:—Common salt; sulphuric acid, nitric acid; minor acids; sodium carbonate; caustic soda; chlorine and bleaching powder; and miscellaneous products. The point of view of the engineer prevails throughout.

*Industrial Chemistry: An Introduction* (an elementary treatise for the student and general reader), by Dr. E. R. Riegel, has been published by the Chemical Catalog Co. (pp. 649, \$9). The primary purpose of the book is to present in a single volume a faithful picture of the numerous commercial activities which make up industrial chemistry: its secondary purpose is to serve as a text book for courses on industrial chemistry such as are usually given in colleges and technical schools. It is based on up-to-date information obtained in the course of professional work in chemical plants, with the collaboration of experts in specific industries, and a study of recent patent literature and government documents. The book covers the industry very thoroughly, and includes sections dealing with chemical engineering, plant, and instruments.

The work of the late Sir James Dewar at the Royal Institution, London, included many important investigations of the properties of soap films. Mr. A. S. C. Lawrence, who for many years acted as Dewar's assistant, acquired a remarkable knowledge of the technique of this work, which knowledge has now been put on record in a book entitled *Soap Films*, published by G. Bell and Sons (pp. 141, 12s. 6d.). In this book (the sub-title of which is "A Study of Molecular Individuality") Mr. Lawrence deals not only with the work of Dewar, but also with that of McBain, Perrin and others who have investigated films and soaps. In the discussion of subjects of this kind, much depends on the illustrations, and in the present instance Mr. Lawrence is to be congratulated on a unique collection of beautiful photographs, which are of great assistance to the reader.

The seventh edition of Treadwell's *Analytical Chemistry: Volume II—Qualitative Analysis*, revised and enlarged by Professor W. T. Hall, of the Massachusetts Institute of Technology, has just appeared (Chapman and Hall, pp. 848, 30s.). This well-known book has been a stand-by to chemists for many years, and is likely to preserve its popularity for a long time to come. The same publishers have issued several other books on analysis, including: (1) *Essentials of Qualitative Chemical Analysis*, by John C. Ware (pp. 351, 17s. 6d.), a striking feature of which is a series of coloured plates to assist in the interpretation of coloured flames, solutions and precipitates; (2) *The Theory and Technique of Quantitative Analysis*, by Marie Farnsworth (pp. 154, 12s. 6d.); and (3) the sixth edition, revised, of *Outlines of Qualitative Chemical Analysis*, by F. A. Gooch and P. E. Browning (pp. 206, 8s. 6d.).

The American Chemical Society continues steadily with the production of its excellent monograph series, one of the most recent being *Soluble Silicates in Industry*, by James G. Vail, chemical director of the Philadelphia Quartz Co. (New York: The Chemical Catalog Co., pp. 443, \$9.50). In this comprehensive work the author deals with his subject under the following headings: The constitution of silicate solutions; definite soluble silicates; reactions; preparation; commercial forms and properties; silicate cements; adhesives; sizes and coatings; deflocculation and detergency; gelatinous films and gels; additional uses. It is of historical interest that the real beginning of industrial uses for soluble silicates occurred in 1825. "Public interest," says the author, "which was keen in 1820, had subsided to a very low ebb in 1867, when W. Gossage and Sons, of Widnes, England, exhibited a soap which was said to contain 30 per cent. of a 20° Baumé solution of sodium silicate. It became very popular, and was made at the rate of 60 tons a week."



## Registration and Scientific Societies

To the Editor of THE CHEMICAL AGE.

SIR,—The second report of the Registration Committee of the British Association of Chemists emphasised the obvious fact that a General Chemical Council must first be elected before any attempt is made to compile a general register.

In this connection the Council of the Association has insisted that close co-operation must be established between all the chemical societies before the General Chemical Council can become an established fact; and it does, therefore, become of importance at this stage to examine the position and to discover, if possible, to what extent co-operation could be made effective.

It may be said at once that co-operation is impossible if complete confidence and goodwill do not exist, and that any policy, however wise and long-sighted, administered no matter how soundly, will be abortive if these first essentials are absent.

To what extent they do, in fact, exist is a matter of opinion among those who have endeavoured, with varying success, to investigate this question; and those opinions vary widely and fundamentally. On the one hand there are those—it is to be feared they grow in numbers—who very emphatically hold the view that the spirit of co-operation is entirely lacking, and that any who endeavour to establish it must tread warily as among dens of basilisks and nests of scorpions. On the other hand, there are with us some who consider that all is for the best in the best of all possible worlds, and that co-operation is now nothing more than a question of machinery. The first view is clearly exaggerated and unfair, but that it exists at all is evidence that the second will not bear too strict an examination.

The truth lies perhaps somewhere between. The scientific societies, very highly organised, are obliged to specialise, and specialisation encourages faction if it is uncontrolled. Emphatically the societies have other duties than that of the propagation of information. One duty they share alike: that of holding men together. No society which cannot succeed in that is in any fundamental sense a society at all.

Only the future can show to what extent success will be won in this direction. The spirit of goodwill and co-operation is there, and nothing more is required than to organise it. It is here that the problem lies, since that kind of organisation requires something more than machinery, however perfect. Without it there can be no true unity, no General Chemical Council, no organised chemical profession.—I am, etc.,

HENRY T. F. RHODES,

Editor, *The Chemical Practitioner*.

British Association of Chemists,  
"Empire House," 175, Piccadilly,  
London, W.1.

## Institute of Chemistry Pass List

THE Institute of Chemistry has issued the following pass list for the April examination, 1929:—

*Examination in General Chemistry for the Associateship:* Cowpe, W. (Royal Technical College, Salford, and Chelsea Polytechnic); Duncan, J. R. M. (Royal Technical College, Glasgow); Geary, J. S. (Municipal Technical College, Hull); Marchant, L. H. G. (College of Technology, Manchester); Metcalf, H. (Technical College, Birmingham); Newns, J. E. (College of Technology, Manchester); Ormrod, G. W. (College of Technology, Manchester); Pavitt, W. F. (University College, London); Pocock, B. (Technical College, Leeds); Shelmerdine, E. J. (College of Technology, Manchester, and Technical College, Derby); and Tetley, J. L. (The University, Cambridge).

*Examination in General Chemistry for the Associateship held in India in January, 1929:* Iyer, V. G. (The University, Madras.)

*Examination for the Fellowship:* In Branch E—The Chemistry, including Microscopy, of Food and Drugs, and of Water: Howes, H. S.; Morris, F.; Shortt, W. M.; and Smith, L. F. In Branch G—Industrial Chemistry: Hannah, J. D.; and Swart, D.

## The Honours List

### Representatives of Chemical Industry and Chemistry

THE Birthday Honours List, issued this week, contains the following names of chemical and scientific interest:—

A BARONY for Sir Edward Allen Brotherton, head of the firm of Brotherton and Co., Ltd. Sir Edward Brotherton has been a generous supporter of educational and charitable institutions. He recently gave £100,000 for the erection and equipment of a new library for Leeds University, having earlier given £20,000 to found a chair of bacteriological research. During the war he equipped the Leeds "Pals" battalion at his own expense, and returned to the national exchequer all the interest on his contribution of £500,000 to the War Loan.

A KNIGHTHOOD for Professor H. C. H. Carpenter, F.R.S., professor of metallurgy in the Royal School of Mines. Professor Carpenter was appointed head of the chemical and metallurgical department of the National Physical Laboratory at the time of its foundation. In 1905 he obtained the Carnegie gold research medal of the Iron and Steel Institute. From 1906 to 1913 he was professor of metallurgy at Manchester. He is a member of the advisory council of the Department of Scientific and Industrial Research, a past president of the Institute of Metals, and has published numerous papers dealing with researches in metallurgy.

A KNIGHTHOOD for Alderman C. H. Bird, chairman and managing director of Bird and Co., Ltd., and a director of the National Benzole Co., Ltd.

A KNIGHTHOOD for Mr. R. T. Nugent, director of the Federation of British Industries.

A KNIGHTHOOD for Mr. H. Sutcliffe Smith, executive director of the Bradford Dyers' Association. He is a past president of the Bradford Chamber of Commerce and of the Society of Dyers and Colourists, chairman of the Colour Users' Association, and a member of the Dyestuffs Advisory Licensing Committee and of the Dyestuffs Industry Development Committee.

A G.B.E. for Sir Arthur Duckham, of the Woodall-Duckham companies, who was chairman of the recent economic mission to Australia.

A G.C.M.G. for Sir John Cadman, chairman of the Anglo-Persian Oil Co., Ltd., and a member of the council of the Department of Scientific and Industrial Research. He has published numerous papers dealing with coal and petroleum problems and is an emeritus professor of the University of Birmingham.

An M.V.O. for Professor E. C. Dodds, head of the department of biochemistry at Middlesex Hospital. Professor Dodds was one of the consultants called in during the King's illness. He has published numerous papers dealing with research in biochemistry.

### German Exports of Phosphoric Acid

THE official German export statistics group the salts of phosphoric acid under one class, of which the bulk is probably the disodium and the ammonium phosphates. The total foreign trade in 1928 rose to 46,500 metric tons as compared with 15,760 tons in 1927. This tremendous growth in German phosphorus compound trade adds strength to the estimates of German phosphorus production as reported by Dr. Johannes Hess, Munich, December 8, 1928, in an address in which he stated the production to be 30,000 metric tons as compared with world production of 33,000 tons (his estimate). Prominent among the buyers of these compounds in 1928 were Denmark, 2,405 metric tons; Great Britain, 1,680 tons; Russia, 7,116 tons; China, 2,008 tons; Japan, 9,370 tons; Brazil, 3,287 tons; and the United States, 9,126 tons.

### Ammonia Plant for Russia

PLANS for the construction in the U.S.S.R. of a factory to produce synthetic ammonia and other fertiliser materials are being prepared by the Nitrogen Engineering Corporation of New York. The contract, calling for the technical assistance of the American firm in the construction and operation of the plant, was ratified by the Soviet Government in February, according to an announcement made by Dr. L. C. Jones, of the Nitrogen Engineering Corporation, and Saul G. Bron, chairman of the board of directors of the Amtorg Trading Corporation.

## Oil and Colour Chemists

### Annual Meeting

THE annual general meeting of the Oil and Colour Chemists' Association was held at the Institute of Chemistry, London, on Thursday, May 30, Dr. J. J. Fox (the president) in the chair.

Before proceeding with the business of the meeting, the president referred to the fact that Mr. J. A. F. Wilkinson (the hon. editor) was retiring from his position, and on behalf of the council presented him with a bookcase, as a small token of appreciation of the work he had done.

### Election of Officers

As the number of nominees was no greater than the number of vacancies, the President announced that the following officers and members of council were duly elected:—President, Dr. J. J. Fox; vice-presidents, H. D. Bradford, Noel Heaton, C. A. Klein, C. A. Mackinlay, and J. A. F. Wilkinson; hon. secretary, R. P. L. Britton; hon. treasurer, S. G. Clifford; associate member of council, S. A. Bone; ordinary members of council, T. Hedley Barry, H. L. Howard, Forrest Scott, T. M. Tyson, and R. S. Morrell.

The annual report of the council for the year ended May, 1929, showed that the membership of the Association had increased by 23, the total membership on May 9, 1929, being 381, consisting of 92 associate members, 285 ordinary members and four junior members. The Council regretted to record the deaths of eight members during the past session: Dr. Charles Beavis, J. Gardner, F. A. Harrop, H. Matthews, Dr. F. M. Perkin, J. M. Tiplady, J. T. Wallace and Joseph B. Shaw.

### Standard Specifications

With regard to specifications and standard tests, it was stated that the committees of the British Engineering Standards Association engaged in the drawing up of British Standard Specifications for pigments and varnishes had continued their deliberations during the past year. Additional specifications had been published during the year, relating to ochre for paints; antimony oxide for paints; purple oxides of iron for paints; zinc chromes for paints; oil pastes (coloured) for paints; tung oil; white titanium dioxide for paints; and tinted oil pastes for paints. Specifications in reparation related to venetian red; turpentine type 2; aluminium powder; purple brown ready mixed paint linseed oil paints; and the British Standard Schedule of Colours.

The annual report of the Manchester Section Committee (of which Mr. T. H. Bridge is chairman) for the year ended December 31, 1928, showed that the membership of the Section at the end of 1928 was 85. Since that date, however, nine new members had been elected, so that the total membership had been increased to 94. It was recorded that Mr. T. H. Bridge was elected to the chair of the Section to fill the vacancy occasioned by the retirement of Mr. J. B. Shaw (who has since died). Mr. G. A. Campbell was appointed vice-chairman.

On the proposal of Dr. G. F. New, seconded by Mr. C. H. Chaplin, the report and accounts were unanimously adopted.

### Details of Bequest to Cambridge University

THE Deputy Vice-Chancellor of Cambridge University, Mr. Weekes, publishes a letter from the solicitors carrying out the will of the late Mr. John Humphrey Plummer, who state that, in view of the conflicting and wholly unauthorised statements that have appeared, the time has arrived when some authoritative statement should be made with reference to the benefactions which will accrue to the University. Briefly stated, the residue of the estate is to be applied in perpetuity for the promotion and encouragement of education in chemistry, biochemistry, physical science, or such other allied subjects in the University as the trustees should think fit. The testator further expressed his desire and intention that his trustees should as soon as possible establish and endow in the University a chair or chairs each of the annual value of £1,200 in accordance with a scheme to be devised. The testator further expressed the desire that the trust should be known as the John Humphrey Plummer Foundation. The trustees are advised that the estate should yield an income to the University of approximately £10,000 a year.

## Chemical Future of Widnes

### Exaggerated Reports of Reductions

AN important statement was made by Mr. C. Imison last week relative to the partial closing down of the Muspratt Works, Widnes. He explained that at that works they carried on two processes—caustic soda and sulphide. The sulphide process was still going on, and had been largely augmented by the transfer to Muspratts of the sulphide formerly made in Birmingham. For the caustic process the primary raw material was soda ash, and in Widnes, unfortunately, they had no brine that was suitable. The United Alkali Co. expended many pounds in trying to pump brine, but it was not suitable for the special process. In these days the saving of a penny on the cost might beat the competitor, and they had to save the cost of bringing the soda ash from Fleetwood or Northwich, where it was made. For that reason I.C.I. decided to close down the caustic plant. The position had been very much exaggerated. In the month that I.C.I. was formed Weston works had practically closed down. Apart from that one works they employed at that time 2,649 men in Widnes, and in the week just ended they employed in the same area 2,480 men. Although they had, according to popular report, closed down a works that employed 600 men, the actual reduction had never been more than 200 men. The reason was that every other works, with the one exception, was employing substantially more men. They had also to remember the financial resources of I.C.I., for they had been able to pay very handsome gratuities. They had paid no less than £12,982 to the men who had been displaced. A very large amount of the credit for that must be given to Dr. Clayton.

### Canadian Industries Appointments

CANADIAN Industries, Ltd., announce the appointment of Mr. George M. Duck, general manager of the Canadian Salt Co., Windsor, as general manager of the heavy chemical division of the former organisation. Mr. Duck has been with the salt company since 1900, and, for the past nine years, has acted as general manager.

Mr. D. A. Pritchard, production manager of the Canadian Salt Co., has been appointed to a similar position with Canadian Industries, Ltd. Mr. Pritchard was formerly electro-chemical manager of the United Alkali Co. He is a member of the Institute of Chemical Engineers, the American Electro-Chemical Society, and chairman of the Alkali-Chlorine Committee.

The operations of the Canadian Salt, Grasselli Chemical and Canadian Ammonia divisions will be under the supervision of these two managers, whose headquarters will be at Toronto.

### Trobridge Golf Cup

A STROKE golf competition was played off on June 3 by the members of the Newcastle Chemical Industry Club for the Trobridge Cup, which has been presented by a member for annual competition. The competition was played on the Ravensworth course, and was thoroughly enjoyed despite a strong wind which affected the scores adversely. The leading returns were:—Dr. G. P. Lishman, 75; F. Gisbert, 83; N. Dawson, 86; F. Hirsch, 87; J. W. Craggs, 87; F. G. Marshall, 87.

Mr. Robert Bowran, J.P., president of the club, presented the cup to Dr. Lishman, who acknowledged his pleasure at being the first winner. In a short speech, Mr. A. Trobridge acknowledged his appreciation of the compliment paid him in naming the cup after him.

### Soda Ash Trade in China

THE total net imports of soda ash into China in 1927 were approximately 58,500 tons, 83 per cent. of which came from Great Britain, 9 per cent. from Hong Kong, 3 per cent. from Japan, and about 2 per cent. from South Africa. About 30 per cent. of this trade enters the port of Shanghai. The control of the trade by Great Britain is due to the closer contact and service made available through the Imperial Chemical Industries merchandising organisation, which carries stocks and offers long term credits to customers in the interior.

## New Inventions in 1928

### Patent Office Report

THE report of the Comptroller-General of patents, designs and trade marks for 1928 has just been issued (H.M. Stationery Office, pp. 24, 6d.). The report states that there were no striking developments to record during the year. The increased activity in invention which had been manifested during the past few years was still more marked in 1928. At the commencement of this expansion in the numbers of applications, the greatest increase was shown in the chemical and electrical industries, but other industries have followed suit and the activity was widely distributed over the whole field of invention.

In the chemical and allied industries, steady development continued in catalytic processes and high pressure catalytic apparatus. The use of aromatic sulphonic acids and salts as cleansers and wetting agents was on the increase. Much attention was being devoted to low-temperature carbonisation processes and to the production and treatment of oils. In connection with oils, notable advances were being made in the technology of oil-cracking processes and in the catalytic production of motor spirit and other valuable oils from crude hydrocarbons and other carbonaceous materials.

Typical specimens were furnished in connection with applications in respect of chemical inventions in 60 cases, 165 sample bottles and 82 dyed or printed specimens being filed.

Separate figures for chemical inventions are not given, but as regards the grand total of all inventions, applications received in 1928 totalled 38,556, 3,087 more than in 1927. The number was the largest for any year, as was the number of complete specifications filed—namely, 24,045, which was 2,648 more than in 1927. The total receipts of the office (including patents fees, £447,505; designs fees, £11,356; and trade marks fees, £50,419) were £544,740, an increase of £32,880. The surplus of receipts over expenditure was £147,840.

### Another German Nitrogen Plant

It is reported that the Prince of Pless interests propose to erect a fixed nitrogen plant in Lower Silesia at Waldenburg to utilise hydrogen for ammonia synthesis from waste coke-oven gases with a proposed initial annual production of 15,000 tons primary nitrogen, to be increased later. The foundation has already been registered as "Stickstoffwerke A. G. Waldenburg in Schlesien," with a capital of 8,000,000 marks.

Such an operation would be favoured by Silesian markets, which so far have depended chiefly on the I.G. for nitrogen fertiliser supplies. It confirms the growing confidence of smaller nitrogen producers in Germany in utilisation of waste coke-oven gases for a cheaper hydrogen supply. Mont-Cenis is in production with its so-called Uhde process in the Ruhr; the Wintershall potash company with the Kloeckner coal company has recently started a similar production at Rauxel; while Ruhr-Chemie A.G., combining coal companies, propose to start production in the near future. These companies propose to produce about 20,000 tons primary nitrogen each. The I.G. Farbenindustrie's nitrogen plants and by-product ammonia enterprises in Germany are at present producing some 800,000 tons primary nitrogen annually for sale by the German Nitrogen Syndicate.

### Coal Carbonisation Developments in Yorkshire

A DEVELOPMENT of coal carbonisation in Yorkshire is foreshadowed by experiments which are being made by Pease and Partners, the Darlington firm of colliery owners, in conjunction with their associated company, T. and R. W. Bower, Ltd. Experiments have been carried out during the past few months, with West Yorkshire small coal at Allerton Main Colliery, near Leeds, on the plant of the Illingworth Carbonisation Co. A plant will be put up to deal with 125 tons of coal daily. The main object of the process is to turn fine or small coal into hard, smokeless fuel, and also to obtain the by-products. Pease and Partners have for many years been considering various low temperature carbonisation plants.

## Lautaro-Anglo-Chilean Nitrate Fusion

### Forecast of Terms

It is believed that the main details of the scheme for the fusion of interests of the Lautaro Nitrate Co. and the Anglo-Chilean Nitrate Corporation have now been settled, and that an announcement will be made to shareholders within a few days. It is understood that a new Canadian company is to be formed, with a capital consisting of cumulative preference shares of \$25 each and 4,000,000 common shares of no par value. Holders of Lautaro shares, it is believed, will receive one preference share for each share held and one common share for each five shares held. As the present Lautaro capital consists of 1,600,000 shares of £5 each, the company's proportion of the new common stock will be 320,000 shares.

The payment to the Anglo-Chilean Corporation for the use of the Guggenheim process is to be made in common shares of the new company, and the plans provide for the erection of plant to the value of between four and five million pounds. The necessary finance for this plant is to be furnished by the issue of a debenture to American interests, who will also hold a large part of the common stock, so that the control of the new company will be predominantly American. An interesting feature of the scheme, it is understood, is that the cumulative preference shares will be made convertible in about six months' time into redeemable preference shares, repayable at £5 10s. The reason for this is that at present the issue of redeemable preference shares is not permitted, but it is anticipated that within six months legislation will be passed to make this possible.

It is suggested in well-informed quarters that the new common shares will be worth anything from \$25 to \$50, and that the value of the shares to be received by holders of Lautaro shares would make the latter worth about £6, compared with the current price of 4½. The Lautaro company decided not long ago to alter the date of the balance sheet from December 31 to June 30. For the half-year ended June 30, 1928, a net profit of £220,488 was made; but no dividend was recommended, and it is considered likely that a dividend will be declared when the formal announcement of the agreement is made. A distribution of 5 per cent. on the capital ranking for dividend would require £328,000.

### "C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

(128) *Abietic Acid and Adipic Acid*.—The names of British manufacturers are required.

### Appointments Vacant

RESEARCH ASSISTANT in Dyeing in the Department of Colour Chemistry and Dyeing of the University of Leeds.—The Registrar, The University, Leeds. July 1.

ASSISTANT CERAMIC CHEMIST for industrial laboratory. Details on p. xxx.

SAMPLER-ASSAYER for manganese mine in Gold Coast Colony. Details on p. xxx.

### New Caustic Soda Factory for Norway

THE Saugbruksforeningen, Holden, one of the largest Norwegian producers of pulp and paper and the largest consumer of alkalis, is building a new electrolytic bleaching plant and will produce caustic soda as a by-product as part of its expansion programme. This industry is constantly growing, so that its alkali requirements expand steadily. Therefore, while it is anticipated that the excess alkali from the above plant will be sufficient to satisfy the remainder of the domestic requirements, this cannot be assured, and it seems likely that the necessity for importing considerable amounts will continue. The 1927 imports of caustic soda amounted to 2,030 metric tons. This increased about 400 metric tons in 1928.



## From Week to Week

R. W. GREEFF AND CO., LTD., have sent a contribution of £50 to the Thanks-Offering Fund.

UNIVERSITY NEWS:—*Durham*: The honorary degree of D.Sc. was conferred on Lord Melchett on Wednesday.

A SPECIAL TYPE OF BOTTLE for poisons, which cannot be mistaken even in the dark, is being produced in Germany. The bottle is covered with sharp protuberances.

THE EMISSION OF FUMES from artificial silk works forms the subject of a report from the chief inspector of alkali works, which is published in the Dyestuffs Supplement, p. 47.

IT IS REPORTED that a large acetate rayon plant is being built at Hopewell, Virginia, by the American Tubize Co. and the Chatillon interests. The cost of the first unit is estimated at \$5,000,000.

ITALIAN EXPORTS of chemical and pharmaceutical products, tanning substances and dyes in January amounted to 19.72 metric tons, valued at 53.4 million lire, as compared with 15.5 metric tons, valued at 46 million lire, in January, 1928.

SADLER AND CO., LTD., of Middlesbrough, have arranged to give their employees a day's outing to Newcastle to visit the North-East Coast Exhibition. Elaborate arrangements are being made to give the party, numbering about 300, a comprehensive tour.

ACCORDING TO A REPORT recently received from U.S.A. Consul B. F. Yost, Sault Ste. Marie, Canada, the Algoma Steel Corporation, since the completion of its motor benzol plant in October, 1928 has exported 1,189,060 lbs. of this product, valued at \$25,256.

AT A MEETING of the Manchester City Council on Wednesday the question was raised of exerting further pressure on the Board of Education in support of proceeding immediately with the full amended scheme for the extension of the Municipal College of Technology.

AN ESCAPE OF GAS at the works of Synthetic Ammonia and Nitrates, Ltd., was accidentally ignited and set fire to some tarred roofing sheets on Friday last. One of the workmen fractured his arm in jumping from the structure he was working on, but no material damage was done.

AFTER LITIGATION lasting many months the Hamburg Court on Tuesday rejected the claim of Dr. Stolzenberg, the proprietor of the Hamburg chemical works from which the gas escaped which caused the disaster of May, 1928, for compensation for his remaining stock of gas, afterwards confiscated and sunk at sea. The plaintiff was ordered to pay costs.

MR. W. J. WELCH has retired from the position of managing director of the Lagunas Syndicate and managing director and secretary of the Lagunas Nitrate Co., but he remains a director of both concerns. The registered offices of the companies have been transferred to Stone House, 123-134, Bishopsgate, London, E.C.2, and the new secretaries are Sabioncello and Co.

THE ELEMENTARY CHEMISTRY LABORATORY of the University College of Hull, equipped by the British Oil and Cake Mills, was formally opened by Mrs. W. J. Pearson, wife of the chairman of the company, on Tuesday. The president of the College, Mr. T. R. Ferens, head of the firm of Reckitts, described, in the course of his speech, the manner in which the employment of chemists had been of value to his own company.

MR. FRANK CARREL, the prominent Canadian industrialist, who is at present on holiday in England, is endeavouring to obtain a number of "talkie" films of leaders of industry on the position of their particular trade. Among others, he is hoping to secure interviews with Lord Melchett, Sir Robert Hadfield, Sir Robert Horne and Sir Edward Stockton. Mr. Carrel, we understand, intends to give luncheon-hour assemblies throughout Canada when the film will substitute the after-lunch speeches.

ATLAS ARTIFICIAL SILK PROCESSES, LTD., according to the chairman's statement at the statutory meeting on Friday, May 31, is spinning on a commercial scale, and by the autumn the production will have increased to 10 tons per week, while towards the end of the year half of the prospectus expectations will be reached, and later a total output of 30 tons weekly should be accomplished. The claim is made that the cost of production by the company's processes is lower than that of other producers. Arrangements have been made for the sale of the whole of the first year's output.

THE CLAY FOR PENCIL LEADS must be absolutely free from grit, and, to achieve this, long grinding or a costly refining by endosmotic means is necessary. It is pointed out by the United States Bureau of Mines, Department of Commerce, that purified bentonites would probably be admirably suitable for the manufacture of pencil leads, and some of the large pencil companies are understood to be using this material already for indelible leads and crayon work, thus effecting a considerable saving in grinding cost. The use of some other wetting agent would eliminate the excessive drying shrinkage resulting from the use of water with alkali types. The manufacturers of indelible leads, crayons, pastel colours, and the like, where grease or wax is used in the mix, would, it is suggested, find bentonite of considerable value as a constituent of their products.

THE BRITISH CARBO UNION, LTD., is to erect a plant for acetone recovery at the Stowmarket works of the British Acetate Silk Co.

THE KUHLMANN COMPANY has recently acquired the factories and grounds of the Dutch Chemical Products Co., Vermet en Fuchs.

ALCOHOL, alone or in combination with glucose solution, is being used as an anaesthetic. The alcohol is injected intravenously. It is claimed that no after-effects ensue. The method is being tried in London.

IN AN EXPLOSION which occurred on Wednesday at the chemical plant of the Gulf and Valley Cotton Oil Co., New Orleans, one person is reported to have been killed and ten injured. The building was totally demolished.

MR. FRED. J. HENSON, manager of the Technical and Research Bureau of the Red Triangle Cement Organisation, has been appointed a director of the Portland Cement Selling and Distributing Co., Ltd., Ship House, 20, Buckingham Gate, London, S.W.1.

CONSIDERABLE DAMAGE was caused by a fire which broke out on Thursday last at the Rainford Tar Distillery Works, Liverpool. The fire, the cause of which is unknown, was difficult to cope with owing to the inflammable tar, naphtha, etc., stored in the tanks, and the entire stock at the works was destroyed.

PETROLEUM REFINERIES, LTD., a new company with a capital of £500,000, with Sir Arthur Grey Hazlerigg at its head, is establishing crude oil refineries at Killingholme, Lincolnshire. The company is to erect a plant for converting crude oil produced by low temperature carbonisation into motor fuel and other products.

THE DIRECTORS of Waste Food Products announce that although the chairman is now in the U.S.A. on the company's business there is no foundation whatever for reports that certain patent rights in America have already been sold. When anything of a definite nature has been concluded shareholders will be immediately notified.

THE Davy centenary celebrations at Penzance were arranged to take place to-day (Saturday) the arrangements having been made by the Royal Geological Society of Cornwall, the Royal Institution of Cornwall, and the Royal Cornwall Polytechnic Society, the headquarters of which are respectively at Penzance, Truro, and Falmouth. At noon to-day the Mayor of Penzance, accompanied by members of the Town Council and of the three Cornish societies, was to proceed to the Davy statue, upon which a wreath was to be placed, and at three o'clock a public meeting was to be held.

INVESTIGATIONS ON INSULIN, carried out by Drs. E. Glaser and G. Halpen in Vienna, have shown that insulin consists of substances which occur where sugar is degraded—in yeast protein, in the pancreas, in cancerous tissue, etc. They are of the opinion that they have shown that insulin is a compound of guanidine and amino-acids. In various plants, substances were found which behaved like insulin, e.g., in turnips. Moreover, ferments possessing the ability to lower the sugar content of the blood were isolated from sheep's liver and horseradish. Of greatest significance is the discovery of the investigators that the action of insulin may be heightened by certain stomach enzymes, by certain substances obtainable from bone marrow, and—best of all—by expressed yeast juice boiled for eight hours. From the above results it is assumed that insulin, at first inactive, needs co-ferments to produce its specific action; that is, it becomes active only on meeting other substances.

WORK IS NOW COMPLETED on the first section of the new low temperature carbonisation plant at the pithead of the Askern Colliery, Yorkshire, and production is expected to begin in the course of the next few weeks. The plant has been erected for Doncaster Coalite, Ltd., by Low Temperature Carbonisation, Ltd., and arrangements have been made with the Askern Coal and Iron Co. for the supply of coal direct from the pit over a period of years. The plant is being erected in two parts, and the portion now completed will have an input of 250 tons of coal per day. This capacity will be doubled when the scheme is completed. The plant will be in continuous operation, day and night. The weekly output is expected to be 1,250 tons of Coalite, 35,000 gallons of coal oil, 4,000 gallons of crude motor spirit, and 10 tons of sulphate of ammonia. In consequence of the widespread demand for smokeless fuel, it has been possible to embrace the Askern output in the contracts which have been arranged between Low Temperature Carbonisation, Ltd., and the coal merchants for the ensuing summer, and, as a consequence, the entire output of the works has been sold in advance, right up to next winter.

### Obituary

MR. J. G. OHLenschLAGER, chairman of Ohlenschlager Brothers, Ltd., on Monday, May 27, 1929.

PROFESSOR JOHN A. MANDEL, well-known for his work on microanalysis, recently, in New York, aged 64.

DR. THEODOR VON HELVEY, one of the leaders of Hungarian chemical industry, in Budapest, at the end of May.

MR. GEORGE GIBSON, analytical chemist to the Weardeale Steel, Coal and Coke Co., Ltd., and formerly in a similar post at New Brancepeth Colliery, recently, aged 39.

# References to Current Literature

## British

**ANALYSIS.**—The determination of unsaturated and aromatic hydrocarbons in light oils and motor spirits. A. B. Manning. *J. Chem. Soc.*, May, pp. 1014-1020.

The determination of available oxygen by the Bunsen method. T. W. Parker and P. L. Robinson. *J. Chem. Soc.*, May, pp. 1106-1108.

A simple method for the determination of phosphorus in coal ash. W. J. Skilling and E. D. Ballantine. *J.S.C.I.*, May 31, pp. 115-118T.

A method for the rapid determination of dust in air. L. C. McNair and J. F. Hirst. *J.S.C.I.*, May 31, p. 127.

Note on the determination of copper and nitrite in solutions of cuprammonium hydroxide. E. Butterworth and H. A. Elkin. *J.S.C.I.*, May 31, pp. 127-128T.

**CELLULOSE.**—The absorptive power of cellulose. S. H. R. Edge. *J.S.C.I.*, May 31, pp. 118-121T.

**DYES.**—Direct cotton dyes from 2:7-diaminofluorene. G. T. Morgan and H. A. Harrison. *J.S.C.I.*, May 31, pp. 125-126T.

**GENERAL.**—The character, properties, and possibilities of bentonite, a sodium clay. R. M. Woodman and E. McK. Taylor. *J.S.C.I.*, May 31, pp. 121-125T. Bentonite is a good emulsifier for certain oils, and to some extent a base-exchange water-softener. Its fault is its impermeability to water.

**SQUALENE.**—The unsaponifiable matter from oils of elasmobranch fish. V. The constitution of squalene as deduced from its degradation products. I. M. Heilbron, W. M. Owens, and I. A. Simpson. *J. Chem. Soc.*, May, pp. 873-883.—VI. The constitution of squalene as deduced from a study of the decahydrosqualenes. I. M. Heilbron. *Loc. cit.*, pp. 883-892.

**STEROLS.**—Studies in the sterol group. III. The acetylation and catalytic hydrogenation of ergosterol. I. M. Heilbron and W. A. Sexton. *J. Chem. Soc.*, May, pp. 921-926.—IV. The existence of isomeric ergosterols. I. M. Heilbron, W. A. Sexton, and F. S. Spring. *Loc. cit.*, p. 926-931.

**THYROXINE.**—Synthesis of an isomeride of thyroxine, and of related compounds. C. R. Harington and W. McCartney. *J. Chem. Soc.*, May, pp. 892-897.

**VITAMINS.**—Further studies of the chemical nature of vitamin A. J. C. Drummond and L. C. Baker. *Biochem. J.*, Vol. xxiii, No. 2, pp. 274-291. Further attempts have been made to separate by fractional distillation, at pressures of about 0.01-2 mm., the vitamin A present in the unsaponifiable matter of certain liver oils. These efforts have not succeeded.

## United States

**CHEMICAL ENGINEERING.**—Calcination. W. S. Dickie. *Ind. Eng. Chem.*, May 1, pp. 461-464.

The conversion of batch into continuous processes. J. V. N. Dorr. *Ind. Eng. Chem.*, May 1, pp. 465-471.

**CONTROL.**—Errors of sampling and measurement rationalised by control. A. E. R. Westman. *Chem. and Met. Eng.*, May, pp. 292-293.

Works control and laboratory equipment. A. Schroder. *Ind. Eng. Chem.*, May 1, pp. 481-485.

Automatic control in chemical industries. I. Ginsberg. *Ind. Eng. Chem.*, May 1, pp. 410-414.

**ECONOMICS.**—Chemical equipment buying invites instalment possibilities. H. B. Lewis. *Chem. and Met. Eng.*, May, pp. 286-287.

**GENERAL.**—Amination by ammonolysis—A unit chemical engineering process. P. H. Groggins. *Chem. and Met. Eng.*, May, pp. 273-275. Deals generally with the production of amines by the action of ammonia on compounds containing halogen atoms, sulphonic acid radicles, hydroxy groups, or labile nitro groups, e.g., aniline from chlorobenzene, 2-aminoanthraquinone from 2-chloroanthraquinone, 2-aminoanthraquinone from the corresponding sulphonic acid, etc.

Convenient chlorine carrier supplied by new product. R. E. Gage. *Chem. and Met. Eng.*, May, pp. 295-296. Deals with the convenient properties of high-test calcium

hypochlorite as a source of "available chlorine," e.g., stability, uniformity, concentration, solubility, and non-deliqescence.

**LOW TEMPERATURE CARBONISATION.**—An economic test of low-temperature coking. R. S. McBride. *Chem. and Met. Eng.*, May, pp. 288-291. Deals with the large-scale operation of the K.S.G. low temperature carbonisation plant at New Brunswick.

## German

**ANALYSIS.**—The determination of the water content of glue and gelatine. E. Sauer and H. Dillenius. *Zeitschrift angewandte Chem.*, May 25, pp. 552-555.

**CELLULOSE.**—Cellulosexanthogenacetic acid. T. Nakashima. *Zeitschrift angewandte Chem.*, May 25, pp. 546-549.

Investigations on allyl cellulose. I. Sakurada. *Zeitschrift angewandte Chem.*, May 25, pp. 549-550.

**GENERAL.**—The results of X-ray tests of materials. H. Becker-Rose. *Chemische Fabrik*, May 29, pp. 270-271.

Means for the removal of air and dust from chemical works. H. Reininger. *Chemische Fabrik*, May 8, pp. 230-232; May 29, pp. 271-273.

The mineral oil industry in 1928. R. Kissling. *Chemiker-Zeitung, Fortschrittsberichte*, May 29, pp. 61-68.

**GLYCOL.**—The glycol industrie. H. Schrader. *Zeitschrift angewandte Chem.*, May 25, pp. 541-556. The preparation of ethylene glycol and its intermediate products; the preparation of derivatives of glycol; technical applications of glycol compounds.

## Miscellaneous

**ANALYSIS.**—Studies on sulphur monochloride. I. New method of determining chlorine and sulphur in sulphur monochloride—II. New method of determining chlorine and sulphur in a carbon disulphide solution of sulphur monochloride. H. Endoh. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 126-127, 127-131B (in English).

The thiocyanogen value and its application. I. The preparation of a solution of free thiocyanogen and the determination of the thiocyanogen value.—II. The selective action of free thiocyanogen towards unsaturated acids. W. Kimura. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 138-141, 141B (in German).

Analysis of acetic anhydride in the presence of strong acids by thermometric titration (supplement). T. Somiya. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 152-153B (in English).

Analysis of a mixture of acetic acid, acetic anhydride and sulphuric acid, and the bath of acetylation of cellulose by thermometric titration. T. Somiya. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 153-154B (in English).

**CEMENT.**—Studies on the bending strength of cement mortars. I. S. Nagai. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 131-133B (in English).

Composition of insoluble residue of various cements. S. Nagai. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 133-134B (in English).

**GENERAL.**—Investigations on soya bean oil. IV. Changes occurring in the production of the polymerised and blown oil. K. Hashi. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 121-125B (in German).

Physico-chemical investigations on aminoacids. I. l-Leucine and its derivatives. G. Takahashi and T. Yaginuma. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 134-138B (in German).

Life of dry cells. I. Rate of discharge and life.—II. Discharge mechanism of grains of active material. N. Kameyama. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 142-144, 144-145B (in English).

Gas appliances and the quality of gas. M. Kurokawa. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 149-152B (in English).

**SULPHURIC ACID.**—On the chamber process. XVII. Analytical study on Glover tower function. M. Matsui and T. Sakamaki. *J. Soc. Chem. Ind. Japan* (supplemental binding), May, pp. 145-148B (in English).

## Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

### Abstracts of Complete Specifications

- 310,635. PURE AMMONIUM SULPHATE, PRODUCTION OF. R. E. Slade, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1. Application date, April 11, 1928.

In the production of ammonium sulphate, finely divided calcium sulphate is treated with ammonium carbonate and the calcium carbonate filtered off. The solution of ammonium sulphate containing ammonia and carbon dioxide is heated to drive off ammonia and carbon dioxide, and the ammonium carbonate solution is crystallised, and the mother liquor returned to the evaporator. The ammonium sulphate crystals may be contaminated with traces of iron from the materials of the plant, which are attacked during the evaporation. This contamination may be reduced by circulating part of the mother liquor back to the reaction vessel in which the first reaction takes place, or to any point prior to the removal of ammonia and carbon dioxide. The precipitate so formed is removed, together with the calcium carbonate. The proportion of the mother liquor treated in this manner is less if alloy steels such as "Staybrite" are used. The ammonium sulphate crystals obtained do not discolour on storage.

- 310,673. AMMONIUM SALTS, METHOD OF PRODUCING. R. Tern, Zinnowitz, Villa Johanna, Germany. Application date, May 16, 1928.

The salts employed, *e.g.*, ammonium sulphate and sodium chloride, are ground together in a colloid mill, and the mixture is fed gradually into an inclined rotary drum having a refractory lining and driven at 15 revolutions a minute. The temperature at the upper end of the drum is 300° C., and the volatile ammonium chloride is drawn off while sodium sulphate is withdrawn at the bottom.

- 310,687. ALKALI METAL NITRATES, PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, May 31, 1928.

Alkali metal nitrates have been obtained by the action of nitric acid on alkali sulphates, but they contain an admixture of bisulphate. In this invention the components are used in the proportion of at least two molecular parts of nitric acid to one molecular part of alkali metal sulphate. Pure alkali metal nitrate is obtained on cooling. The liquor contains sulphuric acid and nitric acid, which may be recovered.

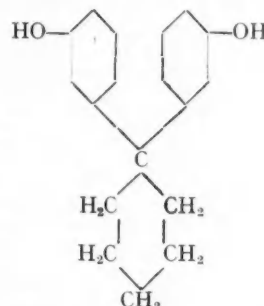
- 310,784. BASIC DERIVATIVES OF ANTHRAQUINONE, MANUFACTURE OF. British Celanese, Ltd., 22 and 23, Hanover Square, London, W.1, J. Hall, H. C. Olpin, G. Reeves and E. W. Kirk, all of Works of British Celanese, Ltd., Spondon, near Derby. Application date, January 31, 1928.

The process is for the manufacture of basic derivatives of anthraquinone by replacement by amino or alkylamino groups of hydroxy groups—*e.g.*, in quinizarin, 1:4-amino-oxy-anthraquinone, 1:4:5-trioxy-anthraquinone, 1:4:5:8-tetra-oxy-anthraquinone, alizarin Bordeaux, diamino-anthrufin, diamino-chrysazin, etc. The amidation and/or alkylamidation are effected in the presence of caustic soda or other alkali, under atmospheric pressure. The oxidation to the basic anthraquinone derivatives may be carried out in the alkaline liquor without separating out the reduced condensation products. The amidation and/or alkyl-amidation may be carried out simultaneously with the reduction of the hydroxy-anthraquinones.

- 310,825. CONDENSATION PRODUCTS FROM HYDROXYBENZENES AND HYDRO-AROMATIC RING KETONES, MANUFACTURE OF. A. Carpmal, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, January 28, 1928.

Hydroxybenzene or an ortho-substituted homologue is condensed with cyclo-hexanone or an alkyl derivative by

means of a hydrohalic acid in the presence of a suitable diluent, preferably in an acetic acid solution. The hydrohalic acid may be in aqueous solution or in solution in an organic solvent, or in gaseous form. The products have the general formula



and are intermediates for the production of dyestuffs and pharmaceutical products.

- 310,832. HYDROGENATED HYDROXY DERIVATIVES OF THE DIPHENYL SERIES, MANUFACTURE OF. A. Carpmal, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, January 28, 1928.

These products are obtained by heating 4:4'-dihydroxy-diphenyl-cyclo-hexane or a homologue—*e.g.*, by distillation in vacuo. A catalyst such as an acid or an acidic or easily dissociating salt may be added. The starting materials are obtained as described in Specification No. 310,825 above. In the decomposition, one molecule of phenol is split off and compounds containing two nuclei are formed which are hydrogenated hydroxy derivatives of the diphenyl series.

- 310,909. AROMATIC ACID CHLORIDES, MANUFACTURE AND PRODUCTION OF. B. W. Henderson, "Ellerslea," Farnworth, Widnes; J. G. Percival, 19, Alder Avenue, Widnes, Lancashire, and Imperial Chemical Industries' Ltd., Imperial Chemical House, Millbank, S.W.1. Application date, February 2, 1928.

Benzoyl chloride is obtained by the chlorination of benzyl alcohol with chlorine and/or hydrochloric acid. This reaction may be combined with the ordinary method of chlorinating benzaldehyde to obtain benzoyl chloride. Thus, instead of employing pure benzaldehyde to be converted into benzaldehyde, the crude mixture of benzyl chloride and benzaldehyde obtained by chlorinating toluene may be used. On hydrolysis this gives a mixture of benzyl alcohol and benzaldehyde, which when chlorinated yields pure benzoyl chloride. Ortho and parachlorobenzoyl chlorides are obtained in a similar manner.

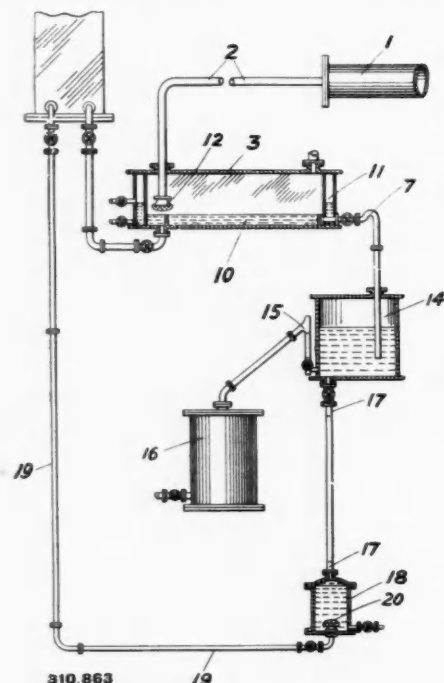
- 310,910. AROMATIC ACID CHLORIDE, PRODUCTION OF. N. Bennett, St. Bede's, Appleton, Widnes, Lancashire; H. Dodd, Temple Cottage, Glazebrook, Manchester; W. C. Sprent, 13, Eastern Drive, Cressington, Liverpool; and Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1. Application date, February 2, 1928.

Benzaldehyde and benzoic acid react to form a mixture of benzaldehyde and benzoyl chloride, and this mixture is chlorinated to convert the benzaldehyde to benzoylchloride, which is the final product of the reaction. Alternatively, the starting materials may be one molecular part of water and two molecular parts of benzaldehyde. These react to produce an equi-molecular mixture of benzaldehyde and benzoylchloride. This is chlorinated to an equimolecular mixture of benzaldehyde and benzoyl chloride, and water is added to hydrolyse the benzoyl chloride to benzoic acid, which reacts with benzaldehyde to form benzoyl chloride. Examples are given.



310,863. ALIPHATIC ACID ANHYDRIDES, MANUFACTURE OF. British Celanese, Ltd., 22 and 23, Hanover Square, London, W.1. S. J. Green and R. R. Widdowson, of British Celanese, Spondon, near Derby. Application date, January 28, 1928.

Aliphatic acids are split into their anhydrides at high temperatures, but these are hydrolysed back to the acid on condensation. In this invention, the hot gases are condensed by directing them on to the surface of a stream of liquid which is a solvent for the anhydride and insoluble in water. The



temperatures should be  $-10^{\circ}\text{C}$ . to  $25^{\circ}\text{C}$ . The solvent may be benzene, mixtures of ethyl ether or chloroform with petroleum ether, gasoline or petrol, kerosene, etc.

The reaction vapours pass from the chamber 1 through pipe 2 to nozzle 12, which directs them in fine streams on to a solvent liquid 10 in the vessel 3, which is cooled by jacket 11. The solvent and dissolved anhydride and separated water pass through pipe 7 to the vessel 14, in which the water forms the lower layer and the solvent and anhydride the upper layer. These pass through pipe 15 to a receiver 16, and the solvent—*e.g.*, ether and petroleum ether—is distilled off. The water passes through pipe 17 to vessel 18, and is scrubbed by the solvent liquid fed through pipe 19 to nozzle 20, and passing through pipe 17 in counter-current.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—283,132 (Chemische Fabrik Johannisthal Ges. and I. F. Trostler) relating to recovery of copper and nickel, see Vol. XVIII, p. 31 (Metallurgical Section); 284,288 (I.G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs, see Vol. XVIII, p. 305; 284,656 (Soc. of Chemical Industry in Basle) relating to dyestuffs, see Vol. XVIII, p. 327; 285,373 (I.G. Farbenindustrie Akt.-Ges.) relating to electrolytic zinc, see Vol. XVIII, p. 39 (Metallurgical Section); 286,685 (I.G. Farbenindustrie Akt.-Ges.) relating to benzanthrone derivatives, see Vol. XVIII, p. 463; 288,319 (Vereinigte Stahlwerke Akt.-Ges.) relating to production of iron, see Vol. XIX, p. 7 (Metallurgical Section); 291,382 (I.G. Farbenindustrie Akt.-Ges.) relating to carbon disulphide, see Vol. XIX, p. 105; 294,238 (Schering Kahlbaum Akt.-Ges.) relating to alkylated phenols, see Vol. XIX, p. 297; 297,001 (I.G. Farbenindustrie Akt.-Ges.) relating to ortho-halogen-anthraquinone-carboxylic acids, see Vol. XIX, p. 466.

#### International Specifications not yet Accepted

308,713. DYES. Chemical Works, Basle, Switzerland. International Convention date, March 27, 1928.

Alkali salts of *p*-diamino-anthrurufin monosulphonic acid or *p*-diamino-chrysazin monosulphonic acid, or mixtures of these in aqueous solution or suspension with small quantities of a mineral acid, are treated with formaldehyde or a polymer to obtain di-(methylamino)-anthrurufin and di-(methylamino)-chrysazin monosulphonic acids.

308,717. FERTILISERS. F. Uhde, 79, Rathenau-Allee, Dortmund, Germany. International Convention date, March 27, 1928.

Potassium, sodium, or magnesium nitrate is added to a hot concentrated solution of calcium nitrate, and the mixture cooled to obtain a solid product containing a high percentage of calcium nitrate which is capable of being strewn.

308,731. FORMIC ACID. Schering Kahlbaum Akt.-Ges., 170, Müllerstrasse, Berlin. International Convention date, March 27, 1928.

Aqueous formic acid is treated with an anhydride which is readily obtained from its acid, *e.g.*, phthalic anhydride, or a dehydration product of boric or phosphoric acid. Anhydrous formic acid is then distilled off.

308,740. ISATINS. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, March 27, 1928.

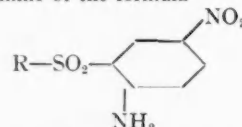
Oxamic acid halides are obtained from the hydrochloride or hydrobromide of a primary aromatic amine and oxalyl chloride or bromide suspended or dissolved in nitrobenzene. These halides are then treated with a condensing agent such as aluminium chloride to obtain isatins.

308,786. HYDROCYANIC ACID. A. N. Galardi, 14, Rue Beauveau, Marseilles. International Convention date, March 29, 1928.

Liquid hydrocyanic acid is kept stable by small additions of dilute sulphuric acid, acetic acid or formic acid, which may contain sulphur dioxide.

308,830. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, March 30, 1928.

A diazotised amine of the formula



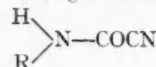
in which R is a substituted or unsubstituted aryl residue, is coupled with a sulphonic acid of 2-naphthylamine or 2:8-aminonaphthol or a derivative or N-substitution product. The nitro group may be reduced. Monoazo dyes giving dyeings fast to light and fulling on animal fibres are obtained.

308,831. SYNTHETIC DRUGS. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, March 31, 1928.

A quinoline compound containing a reactive group such as halogen in the 2- or 4- position is condensed with an aromatic polyhydroxy compound in the presence of nitrobenzene.

308,980. DYE INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, March 29, 1928.

Cyano-formylides of the general formula



where R represents an aromatic residue, substituted or not, containing at least one free *o*-position, are converted into isatins by ring closure by heating to  $60^{\circ}$ – $140^{\circ}\text{C}$ . with aluminium or zinc chloride in the presence of nitrobenzene, trichlorobenzene, or sodium chloride. Examples are given.

309,023. PHOSPHORIC ACID AND SOLUBLE PHOSPHATES. Kunstdünger-Patent-Verwertungs Akt.-Ges., Glarus, Switzerland. (Assignees of F. G. Liljenroth, 12, Danderydsgatan, Stockholm.) International Convention date, April 3, 1928. Addition to 301,864 (see THE CHEMICAL AGE, Vol. XX, p. 130.)

The separation of calcium sulphate from the solution

obtained by leaching raw phosphates is effected at temperatures from 95° C. to boiling point.

- 309,024. CATALYTIC PROCESSES. Selden Co., McCartney Street, Pittsburg, U.S.A. (Assignees of A. O. Jaeger, 9, North Grandview Avenue, Crafton, Pa., U.S.A.) International Convention date, April 3, 1928.

Dehydrogenations, dehydrations such as conversion of alcohols to aldehydes, ketones, or unsaturated hydrocarbons, conversion of polycarboxylic acids or their anhydrides or esters to mono-carboxylic bodies, conversion of aniline to diphenylamine, etc., are effected with the base exchanging catalysts described in specification 304,640. (See THE CHEMICAL AGE, Vol. XX, p. 320.)

- 309,031. THYMOL. Rheinische Kampfer-Fabrik Ges., Oberkassel, Düsseldorf, Germany. International Convention date, April 3, 1928. Addition to 298,600. (See THE CHEMICAL AGE, Vol. XIX, p. 565.)

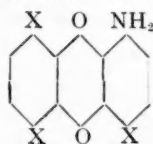
Propylated or iso-propylated derivatives of *m*-cresol are converted into a substitution compound or an addition compound with a salt, and this is treated to cause a migration of the propyl group, and the substituent or addition group is then split off. The sulphonic acids, phosphoric acid esters, etc., are suitable, and a number of examples are given.

- 309,033. PYRIMIDINES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, April 3, 1928.

4- or 3-nitrobenzimidine is converted into an aryl dihydroxy-pyrimidine by heating with the diethyl ester of malonic acid. The hydroxy groups are replaced by chlorine by the action of phosphorus oxychloride.

- 309,087. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, April 4, 1928.

A compound of the formula



in which X in two cases represents hydrogen and in the third case represents NO<sub>2</sub>, NH-acidyl, or NR<sub>1</sub>R<sub>2</sub> (R<sub>1</sub> being hydrogen, alkyl, aralkyl, or aryl, and R<sub>2</sub> alkyl, aralkyl, or aryl), is diazotized, coupled with a component, and if necessary, reduced or saponified. Coupling components include acetoacetic esters and their amides or arylides, pyrazolones, phenol-cresols, resorcinols, 1- or 2-naphthol, and amines. Thus, diazotized 1-amino-4-methyl-aminoanthraquinone is coupled with *m*-toluylene diamine in one example, and other examples are also given.

- 309,090. TITANIUM SULPHATE SOLUTIONS. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, April 4, 1928.

A solution of ortho- or meta-titanic acid in sulphuric acid at 60° C. is treated with ortho- or meta-titanic acid, and the solution concentrated. The titanyl or titanic sulphate solution obtained has a low sulphuric acid content.

- 309,116. PURIFYING GASES. C. J. Hansen, 33, Trappenbergstrasse, Essen, Germany (Assignee of H. Koppe Akt.-Ges., Postfach 948, Essen, Germany.) International Convention date, April 5, 1928.

Coal gas is freed from ammonia and sulphuretted hydrogen by scrubbing with liquor containing oxysulphur compounds of iron and iron hydroxide in such proportions that the scrubbing is complete in a single operation. The spent liquor is divided and treated with sulphurous acid and air respectively to regenerate it.

- 309,161. PRESERVING INDIARUBBER. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of A. M. Clifford, 649, Honadle Avenue, Akron, Ohio, U.S.A.) International Convention date, April 7, 1928.

Ageing of rubber is prevented by means of thio-diphenylamine, thio-phenyl-β-naphthylamine, thio-β-dinaphthylamine, and thio-phenyl-α-naphthylamine.

- 309,163. PERYLENE DERIVATIVES. F. Bensa, 25, Piazza Fontane Marose, Genoa, Italy. International Convention date, April 6, 1928.)

Specification 278,325 (see THE CHEMICAL AGE, Vol. XVII, p. 515) describes the production of dyestuffs by treating diacetyl-dichlor-erylene or dipropionyl-dichlor-erylene with cuprous cyanide in the presence of organic solvents. These products are now oxydised with sodium bichromate, etc., to obtain perylene tetracarboxylic acid. The calcium salt of this acid may be destructively distilled to obtain perylene.

- 309,192-3. DYES AND INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, April 7, 1928.

309,192. Indanthrones with halogen substituents are heated with cuprous cyanide in quinoline to obtain dyestuffs. The treatment of 3·3'-dibromo-N-dihydro-1 : 2 : 2' : 1'-anthraquinoneazine is described.

309,193. Vat dyes and intermediates are obtained by heating 2-amino-3-cyano-anthraquinone in quinoline or pyridine in the presence of cuprous cyanide.

#### Specifications Accepted with Date of Application

- 285,488. Aniline-2 : 5-disulphonic acid, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 18, 1927.
- 285,812. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 21, 1927.
- 286,688. Dihalogen-acylated diphenylethers and highly-active therapeutic substances therefrom, Manufacture of. Schering-Kahlbaum Akt.-Ges. March 9, 1927.
- 287,064. Organic acids, Method of producing. W. J. Hale and W. S. Haldeman. March 12, 1927.
- 290,568. Dry ferric chloride, manganic chloride, or like metallic chlorides, Production of. Vereinigte Stahlwerke Akt.-Ges. May 14, 1927.
- 290,602. Vulcanization of rubber. British Thomson-Houston Co., Ltd. May 16, 1927.
- 295,289. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 8, 1927.
- 295,943. Compounds of the anthracene series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 18, 1927.
- 303,068. Extracting acetylene from gases, Process for. I.G. Farbenindustrie Akt.-Ges. December 27, 1927.
- 304,179. Purification of crude anthracene. Selden Co. January 16, 1928.
- 304,613. Anthanthrone series, Manufacture of dyestuffs of. L. Cassella and Co., Ges. January 21, 1928. Addition to 260,998.
- 311,671. 1 : 3-butyleneglycol, Manufacture of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) February 9, 1928.
- 311,748. Stable solutions of salts of stibinic acids, Manufacture of. A. Carpmal. (I.G. Farbenindustrie Akt.-Ges.) February 15, 1928.
- 311,749. Alloys. International Nickel Co., and E. J. Bothwell. February 15, 1928.
- 311,788. Mono- or polyhydric alcohols, Production of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) December 2, 1927. Addition to 309,200.
- 311,789. High-boiling point hydrocarbons into those of low-boiling point, Conversion of. J. Y. Johnson. (I.G. Farbenindustrie Akt.-Ges.) December 14, 1927.
- 311,798. Cast iron, Manufacture of. International Nickel Co., P. D. Merica, J. S. Vanick and T. H. Wickenden. February 15, 1928.
- 311,799. Alloys. International Nickel Co. and N. B. Pilling. February 15, 1928.
- 311,862. Sulphur trioxide and sulphuric acid, Manufacture of. R. Tern. March 8, 1928.
- 311,899. Liquid hydrocarbons, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 10, 1928. Addition to 258,608.
- 311,934. Nitric acid, Production of. A. E. Mitchell, C. C. Smith and Imperial Chemical Industries, Ltd. May 10, 1928.
- 311,977. 1-amino-anthraquinone-2-sulphonic acid, Manufacture of. Imperial Chemical Industries Akt.-Ges., A. Davidson, W. W. Tatum and G. E. Watts. July 2, 1928.
- 311,986. White lead, Production of. Metallbank und Metallurgische Ges. Akt.-Ges. and G. Sitz. July 17, 1928.
- 311,991. Concentrating ores containing platinum and metals of the platinum group, Process of. A. H. Marks and P. Russell. (Cayser Tin Smelting Co. (Proprietary), Ltd. July 21, 1928.
- 311,998. Treating magnesium and its high percentage alloys in the molten state, Method of. A. L. Mond. (I.G. Farbenindustrie Akt.-Ges.) August 9, 1928.
- 312,007. Beryllium oxide, Manufacture of. H. A. Sloman and A. C. Vivian. August 27, 1928.

## Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

### General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.  
 ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.  
 ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.  
 ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.  
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° TW., Crude Acid, 60s. per ton. 168° TW., Arsenical, £5 10s. per ton. 168° TW., Non-arsenical, £6 15s. per ton.  
 AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.  
 BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.  
 BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.  
 BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)  
 CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.  
 COPPER SULPHATE.—£25 to £25 10s. per ton.  
 METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.  
 NICKEL SULPHATE.—£38 per ton d/d.  
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.  
 POTASH CAUSTIC.—£30 to £33 per ton.  
 POTASSIUM BICHROMATE.—4½d. per lb.  
 POTASSIUM CHLORATE.—3½d. per lb., ex-wharf, London, in cwt. kegs.  
 SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.  
 SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.  
 SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.  
 SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.  
 SODIUM ACETATE 97/98%.—£21 per ton.  
 SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.  
 SODIUM BICHROMATE.—3½d. per lb.  
 SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.  
 SODIUM CHLORATE.—2½d. per lb.  
 SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.  
 SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.  
 SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.  
 SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.  
 SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.  
 SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

### Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. per gall.  
 ACID CRESYLIC 99/100.—2s. 3d. to 2s. 9d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 10d. to 1s. 11d. per gall. Dark, 1s. 7½d. to 1s. 8½d.  
 ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.  
 ANTHRACENE OIL, STRAINED, 1080/1090.—5½d. to 6d. per gall. 1100, 6d. to 6½d. per gall.; 1110, 6½d. per gall. Unstrained, 6½d. to 7d. per gall.  
 BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.  
 TOLUOLE.—90%, 1s. 7½d. to 2s. per gall. Firm. Pure, 2s. to 2s. 2d. per gall.  
 XYLOL.—1s. 5d. to 2s. per gall. Pure, 1s. 8d. to 1s. 9d. per gall.  
 CREOSOTE.—Cresylic, 20/24%, 7½d. to 7¾d. per gall.; Heavy, 6½d. to 6¾d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3½d. to 4½d. per gall. Light gravity, 2½d. to 2¾d. per gall. ex works. Salty, 7½d. per gall.  
 NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent, 90/160, 1s. 3½d. to 1s. 4d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 7d. per gall. Solvent 90/190, 1s. 1d. to 1s. 4d. per gall.  
 NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.  
 NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.  
 PITCH.—Medium soft, 32s. 6d. to 37s. 6d. per ton, f.o.b., according to district. Nominal.  
 PYRIDINE.—90/140, 4s. to 4s. 3d. per gall. 90/160, 3s. 9d. to 4s. per gall. 90/180, 2s. to 2s. 6d. per gall. Heavy, 1s. 6d. to 1s. 9d. per gall.

### Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:  
 ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.  
 ACID ANTHRANILIC.—6s. per lb. 100%.  
 ACID BENZOIC.—1s. 8½d. per lb.  
 ACID GAMMA.—4s. 6d. per lb.  
 ACID H.—3s. per lb.  
 ACID NAPHTHIONIC.—1s. 6d. per lb.  
 ACID NEVILLE AND WINTHER.—4s. 9d. per lb.  
 ACID SULPHANILIC.—8½d. per lb.  
 ANILINE OIL.—8d. per lb. naked at works.  
 ANILINE SALTS.—8d. per lb. naked at works.  
 BENZALDEHYDE.—2s. 3d. per lb.  
 BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.  
 BENZOIC ACID.—1s. 8½d. per lb.  
 o-CRESOL 29/31° C.—5½d. per lb.  
 m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.  
 p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.  
 DICHLORANILINE.—1s. 10d. per lb.  
 DIMETHYLANILINE.—1s. 11d. per lb.  
 DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.  
 DINITROCHLOROBENZENE.—£84 per ton d/d.  
 DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.  
 DIPHENYLAMINE.—2s. 10d. per lb. d/d.  
 a-NAPHTHOL.—2s. per lb. d/d.  
 B-NAPHTHOL.—10d. per lb. d/d.  
 a-NAPHTHYLAMINE.—1s. 3d. per lb.  
 B-NAPHTHYLAMINE.—3s. per lb.  
 o-NITRANILINE.—5s. 9d. per lb.  
 m-NITRANILINE.—3s. per lb. d/d.  
 p-NITRANILINE.—1s. 8d. per lb.  
 NITROBENZENE.—6d. per lb. naked at works.  
 NITRONAPHTHALENE.—1s. 3d. per lb.  
 R. SALT.—2s. 2d. per lb.  
 SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.  
 o-TOLUIDINE.—8d. per lb.  
 p-TOLUIDINE.—1s. 9d. per lb. naked at works.  
 m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.  
 N. W. ACID.—4s. 9d. per lb. 100%.

### Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.  
 ACETONE.—£78 per ton.  
 CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.  
 IRON LIQUOR.—1s. 3d. per gall. 32° TW. 1s. per gall. 24° TW.  
 RED LIQUOR.—9d. to 10½d. per gall. 16° TW.  
 WOOD CRESOTE.—1s. 9d. per gall. Unrefined.  
 WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.  
 WOOD TAR.—£3 10s. to £4 10s. per ton.  
 BROWN SUGAR OF LEAD.—£38 per ton.

### Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.  
 ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.  
 BARYTES.—£5 10s. to £7 per ton, according to quality.  
 CADMIUM SULPHIDE.—5s. to 6s. per lb.  
 CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.  
 CARBON BLACK.—5½d. per lb., ex wharf.  
 CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity, drums extra.  
 CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.  
 DIAPHENYLGUANIDINE.—3s. 9d. per lb.  
 INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4½d. to 5½d. per lb.  
 LAMP BLACK.—£32 10s. per ton, barrels free.  
 LEAD HYPOSULPHITE.—9d. per lb.  
 LITHOPONE, 30%.—£23 per ton.  
 MINERAL RUBBER "RUBFRON".—£13 12s. 6d. per ton, f.o.r. London.  
 SULPHUR.—£10 to £12 per ton, according to quality.  
 SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.  
 SULPHUR PRECIP. B. P.—£55 to £60 per ton.  
 THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.  
 THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.  
 VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.  
 ZINC SULPHIDE.—8d. to 11d. per lb.

### Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.  
 ACID, ACETYL SALICYLIC.—2s. 6d. to 2s. 8d. per lb.  
 ACID, BENZOIC, B.P.2s. to 3s. 3d. per lb., according to quantity.  
 Solely ex Gum, 1s. 3d. to 1s. 4d. per oz., according to quantity.



ACID, BORIC B.P.—Crystal, 30s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—2s. 1d. to 2s. 2d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—10½d. to 11½d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 4½d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—7s. 9d. to 8s. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed, 1s. per lb.

ATROPHINE SULPHATE.—9s. per oz.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.

BISMUTH CARBONATE.—9s. 9d. per lb.

BISMUTH CITRATE.—9s. 3d. per lb.

BISMUTH SALICYLATE.—8s. 9d. per lb.

BISMUTH SUBNITRATE.—8s. 3d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.

BISMUTH OXIDE.—12s. 3d. per lb.

BISMUTH SUBCHLORIDE.—10s. 9d. per lb.

BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTH ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.

BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Ammonium, 2s. 2½d. per lb.; potassium, 1s. 11½d. per lb.; granular, 1s. 10½d. per lb.; sodium, 2s. 1½d. per lb.

CALCIUM LACTATE.—B.P., 1s. 2½d. to 1s. 3½d. per lb.

CAMPOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. .730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.

FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.

GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

IRON AMMONIUM CITRATE.—B.P., 2s. 9d. per lb. Green, 3s. 1d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 9d. to 3s. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 21s. per lb. net; Synthetic, 11s. to 12s. 6d. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 5d. to 1s. 8d. per lb.

METHYL SULPHONAL.—18s. 6d. to 20s. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—2s. 6d. to 2s. 9d. per lb.

PHENAZONE.—3s. 11d. to 4s. 2d. per lb.

PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—96s. per cwt., less 2½ cent.

POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—47s. per lb.; in quantity lower.

SALOL.—2s. 3d. to 2s. 6d. per lb.

SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.

SODIUM FERROCYNIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. to 105s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 5d. per lb. Crystal, 2s. 3d. to 2s. 6d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—9s. 6d. to 10s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.

THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

### Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—11s. per lb.

AMYL ACETATE.—2s. 6d. per lb.

AMYL BUTYRATE.—5s. per lb.

AMYL SALICYLATE.—2s. 9d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—14s. per lb.

COUMARIN.—9s. per lb.

CITRONELLOL.—10s. per lb.

CITRAL.—8s. per lb.

ETHYL CINNAMATE.—6s. 6d. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—12s. 6d. per lb.

GERANIOL (PALMAROSA).—22s. per lb.

GERANIOL.—6s. 6d. to 10s. per lb.

HELIOTROPINE.—6s. per lb.

ISO EUGENOL.—14s. 3d. per lb.

LINALOL.—Ex Bois de Rose, 12s. 6d. per lb. Ex Shui Oil, 10s. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 16s. per lb. Ex Shui Oil, 12s. per lb.

METHYL ANTHRANILATE.—8s. per lb.

METHYL BENZOATE.—4s. per lb.

MUSK KETONE.—34s. per lb.

MUSK XYLOL.—7s. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—10s. per lb.

RHODINOL.—52s. per lb.

SAFROL.—2s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—18s. per lb. Ex Guaiacol, 15s. 6d. per lb.

### Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.

ANISE OIL.—3s. per lb.

BERGAMOT OIL.—20s. per lb.

BOURBON GERANIUM OIL.—21s. per lb.

CAMPOR OIL (White).—1s. 1d. per lb.

CANANGA OIL, JAVA.—11s. 6d. per lb.

CASSIA OIL, 80/85%.—6s. 3d. per lb.

CINNAMON OIL LEAF.—9s. per oz.

CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. 4d. per lb.

CLOVE OIL (90/92%).—10s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10½d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 17s. 6d. per lb.

LEMON OIL.—17s. per lb.

LEMONGRASS OIL.—4s. per lb.

ORANGE OIL, SWEET.—25s. per lb.

OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.

PALMA ROSA OIL.—12s. 6d. per lb.

PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 14s. per lb.; Japanese, 7s. 6d. per lb.

PETITGRAIN.—8s. 6d. per lb.

SANDALWOOD.—Mysore, 28s. 6d. per lb.; 90/95%, 20s. per lb.

## London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, June 6, 1929.

SLIGHTLY more activity can be reported in the markets during the past week, although the demands are mainly for near requirements. Calls on contracts are about up to average and there is a tendency for the demand to broaden. Prices continue steady. Export trade is fair.

### General Chemicals

ACETONE.—There is no change to report in this market, the product still in somewhat short supply and demand moderately fair. Prices firm at £75 to £85 per ton, according to quantity.

ACETIC ACID.—A rather better demand has been received with prices firm at £36 10s. to £37 10s. for the 80% technical quality.

CITRIC ACID.—In moderate request with the price unchanged at the firm rates of 2s. 2d. to 2s. 3d. per lb.

FORMIC ACID.—Rather quiet conditions rule this market with demand somewhat slack. Prices are unchanged at about £42 per ton for 85% material.

LACTIC ACID.—A small trade is passing with the market showing no change at £43 per ton for 50% by weight, technical quality.

OXALIC ACID.—The business has been somewhat brighter, the demand being better than for some time. Prices continue firm at £30 10s. to £32 10s.

TARTARIC ACID.—The market is receiving a larger volume of enquiry and prices are unchanged at the firm rates of 1s. 4½d., less 5%.

ALUMINA SULPHATE.—Rather heavy demands are on the market, with supplies continuing short. Price is very firm at £7 15s. to £8 per ton.

ARSENIC.—The improved demand continues although there is little change in price which is steady at £16 5s. f.o.r. mines.

BARIUM CHLORIDE.—If anything, this product is again firmer with supplies scarce for early delivery. Forward prices are also higher. The price for spot supplies is nominally £11 10s. per ton.

CREAM OF TARTAR.—Higher prices have been quoted during the past week with the enquiry active. Best B.P. quality 99/100% is firm at about £98 to £100 per ton.

COPPER SULPHATE.—There has been a brisk demand from certain export markets and price has firmed somewhat. Present price about £27 to £28 per ton.

FORMALDEHYDE.—An improved demand has been received and there is no change to report in the price which holds steady at £39 per ton.

LEAD ACETATE.—Rather a better demand has been received, price continuing steady at £44 for White, and £43 for Brown.

LEAD NITRATE.—Demands somewhat slow with price a little easier at about £33 15s.

LIME ACETATE.—In steady demand at about £18 per ton.

LITHOPONE.—Unchanged and in fair request at £19 15s. to £22 per ton.

METHYL ACETONE.—Quite brisk trading is reported with the price firm at £58 to £60 per ton.

POTASSIUM CHLORATE.—Steady at £28 to £30 per ton.

POTASSIUM PERMANGANATE.—The market is meeting a fairly satisfactory demand with prices unchanged at about 5½d. per lb. for the best B.P. quality.

POTASSIUM PRUSSIAN.—A larger volume of business is passing with prices firm at £63 10s. to £65 10s. per ton.

SODIUM ACETATE.—Crystal quality is still in rather short supply with the market firm at £22 10s. to £23 per ton.

SODIUM BICHROMATE.—Quite a brisk demand is being received and the market remains firm at 3½d. (with discounts for contracts).

SODIUM HYPOSULPHITE.—The commercial quality is in rather slow demand and Pea Crystals photographic quality in better request at about £14 10s. to £15 per ton.

SODIUM NITRITE.—Demand has been fair with the market unchanged at about £20 per ton.

SODIUM PHOSPHATE.—Unchanged at £12 per ton, for dibasic, and £16 10s. for tribasic.

SODIUM PRUSSIAN.—Firm and in good request at 4½d. to 5½d. per lb.

TARTAR Emetic.—Rather slow of sale at about 11½d. per lb.

ZINC SULPHATE.—Unchanged at about £12 per ton.

### Coal Tar Products

There is no change to report in the prices on the market for coal tar products, which still remains quiet.

MOTOR BENZOL remains at 1s. 7d. to 1s. 7½d. per gallon, f.o. makers' works.

SOLVENT NAPHTHA is quoted at 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA is unchanged at 1s. 2d. per gallon, f.o.r.

CREOSOTE OIL is unchanged at 3½d. to 4d. per gallon in the North, and at 4½d. to 5d. per gallon in London.

CRESYLIC ACID is quoted at about 1s. 10d. per gallon for the 98/100% quality, and at about 1s. 8d. per gallon for the dark quality, 95/97%.

NAPHTHALENES remain unchanged. The firelighter quality is quoted at about £4 10s. per ton, the 74/76 quality at about £5 per ton, and the 76/78 quality at £6 to £6 5s. per ton.

PITCH.—There is no change to report in the forward market, which remains at a nominal figure of 35s. to 37s. 6d. per ton, f.o.b. East Coast.

### Nitrogen Products

Sulphate of Ammonia.—During the last week the market has weakened further, and the price f.o.b. U.K. port is about £9 1s. 3d. per ton in single bags for neutral quality 20.6 % nitrogen. The steady drop in price for the last month is due to the cessation of demand for immediate consumption and the throwing on a well-stocked market of additional supplies. No doubt the price will become stabilised as soon as the large continental producers announce their prices for the new season. The great growth in the demand for nitrogen witnessed during the last year inclines us to the view that the price scale will be very little, if any, lower than that in operation last year.

Home.—Home buying has eased off considerably.

Nitrate of Soda.—The selling companies continue to quote £10 13s. per ton delivered. There is no doubt that the new methods of sale have resulted in a vast increase in consumption. In the United States, where no prices were fixed, a small drop in the market has resulted from the end-of-season decline in consumption.

### Latest Oil Prices

LONDON, June 5.—LINSEED OIL was in better request at 2s. 6d. per ton advance. Spot, £28 17s. 6d., ex mill; June to August, £28; September-December, £28 5s.; January-April, £28 12s. 6d., naked. RAPE OIL was slow. Crude extracted, £40 15s.; technical refined, £42 15s., naked, ex wharf. COTTON OIL was quiet. Bombay crude, £26; Egyptian crude, £26 10s.; refined common edible, £32, naked, ex mill. TURPENTINE was quiet and occasionally 3d. per cwt. lower. American, spot, 43s. 9d.; June, 43s.; and July-December, 42s.

HULL.—LINSEED OIL.—Spot to September-December, £28 5s. per ton, naked. COTTON OIL.—Bombay crude, £26 5s.; Egyptian crude (new), £26 15s.; June-August, £26 5s.; edible refined, £30 10s. technical, £30 5s.; deodorised, £32 10s. per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., £31 10s. per ton, naked. GROUND-NUT OIL.—Crushed/extracted, £32 10s.; deodorised, £36 10s. per ton. SOYA OIL.—Extracted and crushed, £30; deodorised, £33 10s. per ton. RAPE OIL.—Crushed/extracted, £40 10s.; refined, £42 10s. per ton, ex mill, net cash terms. (The spot prices are fixed by the Hull Committee.) TURPENTINE, CASTOR OIL and COD OIL unchanged.

### South Wales By-Products

SOUTH WALES by-product activities continue to be unsatisfactory. The demand for pitch has fallen back slightly, but prices are firmly maintained round 32s. to 34s. per ton. Road tar remains quiet, with quotations steady at from 10s. 6d. to 13s. 6d. per 40-gallon barrel, but crude tar has a slightly better call with quotations firm at from 25s. to 27s. per ton. Creosote continues to be in poor request, and is on offer at from 4d. to 5d. per gallon. Refined tars continue to have a bright market, quotations for gasworks and coke oven tar being unchanged. Whizzed naphthalene has a poor demand round 100s. per ton, and a similar remark applies to crude at about 80s. per ton. Patent fuel and coke exports maintain their slight improvement, but there is room for considerable increase in tonnage before a satisfactory figure is reached. Patent fuel quotations are:—ex ship Cardiff, 21s. to 21s. 6d.; ex ship Swansea, 20s. to 20s. 6d. per ton. Coke quotations are: Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 26s. 6d. to 32s., and furnace from 21s. to 23s. per ton. Oil imports, all from Persia, over the last four ascertainable weeks, amounted to 15,952,830 gallons.

### Report on Eastern Belgium

HIS MAJESTY'S CONSUL AT LIÈGE (Mr. F. O'Meara) has furnished the Department of Overseas Trade with a confidential memorandum on some aspects of trade and industry in Eastern Belgium, with particular reference to the appointment of agents in this market. Copies of the memorandum may be obtained by any United Kingdom firms interested on application to the Department.

## Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, June 5, 1929.

SINCE our last report business in the heavy chemical market has shown signs of improvement, inquiry both for home and export business being appreciably more than for some weeks past. There are no changes of any importance to record.

### Industrial Chemicals

ACETONE.—B.G.S. £76 10s. to £85 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—98/100% Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports. 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC ICE CRYSTALS.—Unchanged at 6½d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC B.P. CRYSTALS.—Quoted 2s. 2½d. per lb., less 5% ex store, spot delivery. Offered at 2s. 2½d. per lb., less 5% ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy; dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Price remains unchanged at about 3½d. per lb., ex store. Offered for prompt shipment from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—In scarce demand and price now quoted about £7 per ton, ex wharf.

ALUM LUMP POTASH.—Unchanged at about £8 12s. 6d. per ton, c.i.f. U.K. ports. Crystal meal offered on spot at £9 per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra, and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in five-cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 88°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of British manufacture, quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Quoted £37 per ton, c.i.f. U.K. ports, prompt shipment from Ch na. Spot material unchanged at about £40 per ton, ex store.

ARSENIC, WHITE POWDERED.—Unchanged at £18 5s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £10 10s. per ton, c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum four-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Still in fairly good demand and price now quoted is £36 10s. per ton, ex store.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—On offer at £29 15s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton; brown on offer about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE, 96/98%.—Spot material now quoted £26 10s. per ton, ex store. Offered from the Continent £25 10s. per ton, c.i.f. U.K.

POTASSIUM CHLORATE, 99½/100%.—Powder. Quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIAN (YELLOW).—Offered for prompt shipment from the Continent at 6½d. per lb., ex wharf. Spot material quoted 7d. per lb., ex store.

SODA CAUSTIC.—POWDERED, 98/99%.—Now £17 10s. per ton in drums; £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and 70/75% £14 2s. 6d. per ton in drums, all carriage paid buyers' stations, minimum four-ton lots, for contracts 10s. per ton less.

SODIUM ACETATE, 65%.—Crystal quality quoted about £19 15s. per ton, ex wharf; 73/78% anhydrous quality on offer at £20 per ton, carriage paid buyers' stations.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Manufacturers advise an advance in price of ½d. per lb., making the spot price now 3½d. per lb. delivered as from July 1, with special concession for contracts from 2½ tons up to 25 tons.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton, ex quay, minimum four-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality quoted £10 12s. per ton, carriage paid buyers' sidings, minimum six-ton lots, usual extras for small quantities and refined qualities.

SODIUM PRUSSIAN.—Spot material quoted 7d. per lb. Offered for prompt shipment from the Continent at 6½d. per lb., c.i.f. U.K. ports.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 per ton. Broken, 60/63%, £10 per ton. Crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton f.o.b., U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

### Polish Production of Nitrogen Compounds

POLAND has now four factories manufacturing nitrogen compounds: "The Azot" S.A. in Jaworzno; the "Chorzow" Government Nitrate Factory in Chorzow; the "Skarboferm" plant at Knurów; and "Oswag" S.A. in Wyrz. Another factory is now being built by the Government at Tarnow. The most important of these factories is the Government plant at Chorzow where production during the first quarter of 1929 amounted to 39,028 tons of calcium cyanamide, of which 8,561 tons were used in the manufacture of ammonia.

The new Government factory in Tarnow, which will be completed before the end of 1929, and which will immediately begin production by the Fauser method, is expected to have a production of about 100 tons of nitrate of ammonia and about 75 tons of sulphate of ammonia per day. According to the Polish Ministry of Industry and Commerce, the joint production of the Chorzow and Tarnow plants within the next two or three years will not only cover the entire domestic demand for nitrogenous fertilisers, but will create a surplus for export.



## Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, June 6, 1929.

THERE has been quite a steady recovery in conditions in the chemical market here, and the volume of business put through during the past week has been fully equal to the pre-Whitsun level. Specifications for contract deliveries relate to reasonably good quantities. For prompt or near date deliveries there is a fair amount of inquiry in the open market, and sales during the past week have been on moderate lines at a generally steady range of prices.

### Heavy Chemicals

Phosphate of soda has been in quietly steady demand and current values appear to be quite firm at from £12 to £12 5s. per ton. There is no big weight of business passing in the case of sulphide of sodium, but offers of this material are maintained at about £8 per ton for the commercial kind and £9 for the 60-65 per cent. concentrated quality. Steady deliveries of caustic soda are being made against contracts at from £12 15s. to £14 per ton, according to quality, with a fairly active demand for odd lots at the usual premium. Prussiate of soda meets with a moderate amount of inquiry, at up to 5d. per lb. There is not a great deal of activity in the case of saltcake, but offers of this keep reasonably steady at from £2 12s. 6d. to £2 15s. per ton. Moderate sales of hyposulphite of soda has been reported here this week, and values are held, the photographic grade being quoted at about £15 10s. per ton and the commercial at about £8 15s. Bicarbonate of soda meets with a pretty regular demand at firm prices, contract quotations being on the basis of £10 10s. per ton. With regard to alkali, this material is in fair request at round £6 per ton. A quiet business is being transacted in chlorate of soda, offers of which are maintained at from 2½d. to 3d. per lb. Bichromate of soda continues firm on the basis of 3½d. per lb., and sellers report a fair volume of inquiry in circulation.

Yellow prussiate of potash shows no change in prices on the week, these ranging from 6½d. to 7½d. per lb., a moderate trade being done. Chlorate of potash is in quiet request, with current offers in the region of 3½d. per lb. Sales of permanganate of potash during the past week have been rather slow, but quotations in this section keep steady at from 5½d. to 5½d. per lb. for the B.P. grade and round 5d. for the commercial. Caustic potash continues firm at from £33 5s. per ton for prompt delivery of one to five-ton lots, and a fair demand is reported. Carbonate of potash, also, is fairly active and values are held at about £26 5s. per ton. Bichromate of potash is quoted at from 4½d. to 4½d. per lb., and quietly steady sales of this material are being made.

Only a moderate inquiry has been reported this week in the case of sulphate of copper, prices ranging from about £28 to £28 10s. per ton, f.o.b. Arsenic is by no means active, sales having been quiet at £16 per ton at the mines for white powdered, Cornish makes. A limited business has been done in lead acetate at somewhat easy prices, the white quality being on offer at round £40 per ton and the brown at from £39 to £39 10s. Nitrate of lead is on the slow side, with quotations at from £34 to £34 10s. per ton. There has not been much stirring in the case of acetate of lime though values in this section are pretty much as they were a week ago, with grey quoted at about £16 15s. per ton and brown at £8 10s.

### Acids and Tar Products

A quietly steady business is being put through in both citric and tartaric acids, with current values at round 2s. 2d. and 1s. 4½d. per lb., respectively. With regard to oxalic acid, inquiry for this is on somewhat restricted lines but prices are fairly steady at £1 11s. 6d. per cwt., ex store. Acetic acid continues very firm and sales keep up at a fairly satisfactory level; the 80 per cent. commercial grade is quoted at about £36 10s. per ton and the glacial at £67.

There is a fair amount of inquiry about for pitch for forward delivery though not many firm orders so far; quotations are at round £1 16s. per ton, f.o.b. Creosote oil is in rather quiet demand, with values ranging from 2½d. per gallon, naked. Crude 60's carbolic acid is in steady request at 1s. 11d. per gallon, naked, with crystallised material firm and active at about 6½d. per lb., f.o.b. Solvent naphtha continues to move in moderate quantities, with offers at from 1s. 3d. to 1s. 3½d. per gallon.

## Company News

INTERNATIONAL COMBUSTION, LTD.—A dividend of 6 per cent. on the preference shares was declared on May 29.

A. BOAKE, ROBERTS AND CO.—A final dividend of 1 per cent., tax free, is proposed on the ordinary shares, making 7 per cent. for the year, placing £5,000 to the reserve, and carrying forward £25,830.

CAPE ASBESTOS CO.—The profit for 1928 was £52,210, and £11,861 was brought forward. A final dividend of 10 per cent. per annum on the ordinary shares and on the preference shares of an amount equivalent to the final dividend on the ordinary shares are recommended, carrying forward £12,322.

SCOTTISH OILS.—For the year to March 31 last, the report shows that the balance at credit of profit and loss account including a sum of £30,230, brought forward, and after providing for depreciation, was £212,381, against £195,175 last year. The dividend on the 7 per cent. preference shares requires £165,945, and the sum of £46,436 is carried forward.

NEW TAMARUGAL NITRATE CO.—It is announced that the local board in Chile has declared an interim dividend of 5 per cent. (1s. per share), less income tax, for the year to July 31, 1929, payable on June 26, 1929. Last year there were two interims of 3 per cent. and 2 per cent. respectively, followed by a final of 2 per cent., thereby making a total of 7 per cent. For 1926-27 no dividends were paid.

J. C. AND J. FIELD.—The report for the year ended March 31, 1929, states that the profit and loss account shows that after providing for repairs and depreciation, income tax, directors' and auditors' fees, legal charges and expenses of secretary's department, there is a profit of £12,252 (against £12,150), to which is added £7,099 brought from last account, making £19,351. The board recommends a dividend of 10 per cent. on ordinary shares, less income tax (same), carrying forward £7,267.

YORKSHIRE DYEWARE AND CHEMICAL CO.—The report for the year ended March 31 states that, after providing for depreciation of property, plant and machinery, and all other charges, the surplus amounts to £15,302, and £2,226 was brought forward. Interest on debenture stock absorbed £4,104, and interim dividend took £3,000, leaving a balance of £10,424. The directors recommend a dividend at the rate of 7½ per cent. (making 10 per cent. for the year), carrying forward £1,424.

"SANITAS" CO.—For the year ended March 31, 1929, the report states that the balance at the credit of profit and loss account, including £3,130 brought forward, amounts to £62,652. From this £7,326 has been paid as dividend on the preference shares for the half-year ended September 30, 1928, and £13,750 as interim dividend on ordinary share leaving, after payment of final dividend of 4½ per cent. on preference shares and a final dividend of £31,250 on ordinary shares, a balance of £3,000 to carry forward.

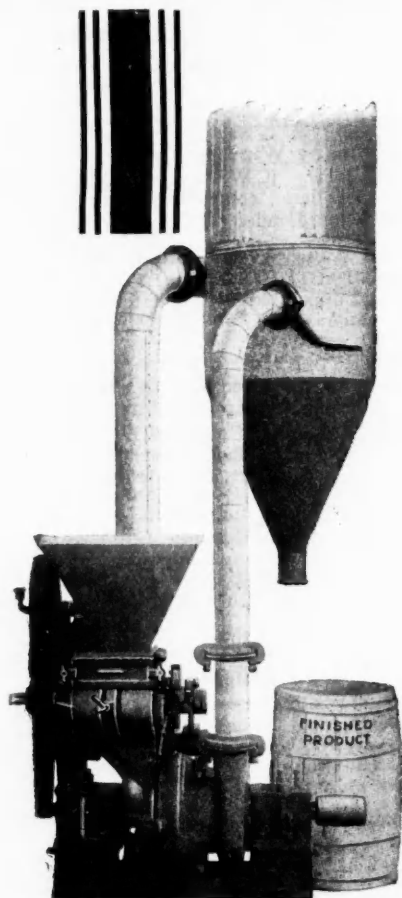
ZINC CORPORATION.—The net profit for 1928 is £255,534, as compared with £259,278 for 1927. Adding £42,103 brought forward, and £76,289 appropriations for new plant unexpended there is £373,926. After providing for fixed preferential dividends (4s. per share), participating dividends (4s. per share), and appropriations for mine development and new plant £100,000, a balance of £45,021 is carried forward. An interim participating dividend of 1s. 6d. per share on preference and ordinary shares was paid on January 3, 1929, and the directors recommend final dividend of 2s. 6d. per share.

STANDARD CHEMICAL CO.—A dividend of \$1 per share, being final dividend for year ending March 31, 1929, and a bonus of \$1 per share for same period, are announced, payable on June 25 upon the shares of the company having no nominal or par value to shareholders of record on May 25. Such dividend will also be paid to shareholders from time to time thereafter, who surrender to company for exchange, stock certificates representing preference and/or common share, having par value for shares having no nominal or par value.

### Australian Fertiliser Merger

A CABLE from U.S.A. Trade Commissioner Squire of Sydney states that three of the leading manufacturers of chemical fertilisers in Australia—Mount Lyell, Cuming Smith, and Wischer and Co.—are planning a merger with a capital of approximately \$20,000,000.

# A DUSTLESS UNIT



**Belt-Driven  
Model No. "0000"  
Raymond  
Pulveriser.**

This compactly built Pulveriser was designed especially to supply an urgent need in the process industries for a machine capable of grinding small lots of materials with the same economy and quality of production as the larger Raymond units.

These pulverisers are being used successfully in over 300 plants for the reduction of Clays, Chalk, Chemical substitutes, Dyes, Insecticides, Dry Colours, Filter Press Products, Gypsum, Kaolin, Litharge, Lime (Hydrated and Burnt), Moulding Compounds, Ochres, Pigments, Paris Green, Sulphur, Talc, Umbers, etc., etc., etc.

*We shall be pleased to carry out tests on your particular material at our new Test House at Derby.*



**INTERNATIONAL COMBUSTION LTD.**

GRINDING & PULVERIZING OFFICES  
11, Southampton Row, London, W.C.1.

Telephone: Holborn 12178 Cable & Telegraphic Address: "Raymond, Westcent, London"

WORKS: - DERBY - ERITH.



# RAYMOND

## '0000' PULVERISER

## New Chemical Trade Marks

### Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 29, 1929.

#### ARMONSOL.

501,536. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. The Mond Staffordshire Refining Co., Ltd., 47, Victoria Street, London, S.W.1; merchants and manufacturers. April 5, 1929. To be associated with No. 455,798 (2,455) and others.

#### ARMONSOL.

501,537. Class 3. Chemical substances prepared for use in medicine and pharmacy. The Mond Staffordshire Refining Co., Ltd., 47, Victoria Street, London, S.W.1; merchants and manufacturers. April 5, 1929. To be associated with No. 455,799 (2,455) and others.

#### OPACOL.

499,708. Class 3. Chemical substances prepared for use in medicine and pharmacy. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11; manufacturers. February 5, 1929. To be associated with No. 478,478 (2,561).

## Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

**CHEMICALS AND PLANT FOR ENAMELLING.**—A firm of enamelware manufacturers at Osaka desire to be placed in touch with United Kingdom manufacturers and suppliers of (a) aluminium oxide, cobalt oxides, antimony oxide, zinc oxide, chromium oxide, silicon oxide, borax and colouring matter for use in making enamel goods; (b) enamelling sheets; (c) furnaces; and (d) automatic machinery for making enamelware. (Reference B.X. 5,338.)

**MATERIALS FOR PAINT AND VARNISH.**—A firm of manufacturers of oils and finishes for the textile and tanning trades in Montreal desire to obtain agencies for ester gums, plasticisers and retarding agents for paint manufacturers, also colours for enamel. (Reference No. 481).

## Sterilisation of Cooling Water

### An Interesting New Publication

ONE of the most striking developments in power plant practice is undoubtedly the sterilisation of the cooling water for steam turbines to prevent organic growths on the condenser tubes, thus enabling the full vacuum to be obtained continuously, while the same principle is used to eliminate shell-fish in cooling waterpipes, and weeds in cooling towers. In this connection a fifth and much enlarged edition of the book, *Water Sterilisation by Gaseous Chlorine*, has been issued by the Paterson Engineering Co., Ltd. This gives a comprehensive description, with numerous illustrations and diagrams, of the whole principle of the use of chlorine gas, not only for the sterilisation of cooling water, but also for town's water, swimming baths, sewage and sewage effluents, and many other sections of the subject. The firm are, of course, well known in the field of water purification. They introduced the "Chloronome" apparatus (chlorine dispenser) in 1917. This is coupled to cylinders of liquid chlorine, and supplies continuously and automatically any desired amount of chlorine to bulk volumes of water, generally about one part to two or three million, while allowing of extremely accurate regulation by means of a single valve. Towards the end of 1927 more than 1,800,000,000 gallons of water were being treated every 24 hours throughout the world by the "Chloronome." The chief value of sterilisation by means of 100 per cent. chlorine gas is that the latter is absolutely stable under all conditions of temperature.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### London Gazette, &c.

#### Company Winding Up

ROSEN (SILKS) LTD. (C.W.U., 8/6/29.) Meetings, June 13, creditors, 11.30 a.m., contributories, 12 noon, 33, Carey Street, Lincoln's Inn, London, W.C.2.

#### Companies Winding Up Voluntarily

GELATINE MANUFACTURING CO., LTD. (C.W.U.V., 8/6/29.) E. L. Donald appointed as Liquidator. Meeting of creditors at 46, Holborn Viaduct, London, E.C.1, on Tuesday, June 11, at 12.30 p.m.

HOWE (COVENTRY) LTD. (C.W.U.V., 8/6/29.) By special resolution, May 13, confirmed May 28. H. Lapworth, of 48, Edward Street, Nuneaton, appointed as Liquidator.

RUSSIAN COPPER SYNDICATE, LTD. (C.W.U.V., 8/6/29.) By special resolution May 7, confirmed May 24. H. H. Mason, Chartered Accountant, appointed as Liquidator.

### Bankruptcy Information

HOWANDER, Sven, 36, Kensington Gardens Square, London, and WILSON, Augustus Hatherway, 43, Palace Court, Kensington, London, lately trading with another under the firm name of the ALUMINIUM REFINERY, at the Broadway, Hanwell, Middlesex. (R.O., 8/6/29.) Receiving order, May 29, creditor's petition.

### Partnership Dissolved

RICHARDSON AND SON (James RICHARDSON, John James RICHARDSON, and James Joseph FULWOOD), manufacturers and dealers in cleansers and polishes, 21, St. George's Road, Kingston-upon-Hull, by mutual consent as from May 25, 1929. Debts received and paid by J. Richardson and J. J. Richardson, who will continue the business under the old style.

### Receivership

DALTON CHEMICAL WORKS, LTD. (R., 8/6/29.) G. W. Smith, C.A., of 23, John William Street, Huddersfield, ceased to act as Receiver on January 22, 1929. (Notice filed May 23.)

## New Companies Registered

T. AND R. W. BOWEY (ILLINGWORTH) CARBONIZATION CO., LTD., 92, Northgate, Darlington. Registered as a "private" company on May 30. Nominal capital £75,000 in £1 shares. The objects are to carry into effect (1) a licence by the Illingworth Carbonisation Co., Ltd., to the company of a full but non-exclusive licence to use and exercise the inventions referred to therein, and to vend and dispose of the products thereof upon the terms and subject to the conditions therein mentioned, (2) a lease from T. and R. W. Bower, Ltd., of certain land, and (3) a contract with the last-named company for the supply of coal; to acquire certain inventions relating to the carbonisation of coal and other by-products, etc. Directors: S. E. Illingworth, Sir Richard A. Pease, Bt., S. R. Illingworth, H. Greener.

### Chinese Tung Oil Exports

A CABLE dated May 4, from U.S.A. Consul General F. P. Lockhart, Hankow, reports the total April tung oil exports from Hankow as 7,694,160 lb., of which 6,722,000 lb. were shipped to the United States and 972,160 lb. to Europe. Stocks of oil at Hankow at the end of the month were estimated at approximately 3,500 short tons.

### Pyrates Production in Spain

PRODUCTION of copper and iron pyrites in Spain during the past three years has averaged approximately 3,620,000 metric tons. The 1926 production was 3,650,390 tons; 1927, 3,602,870 tons; and 11 months of 1928, 3,606,710 tons.



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